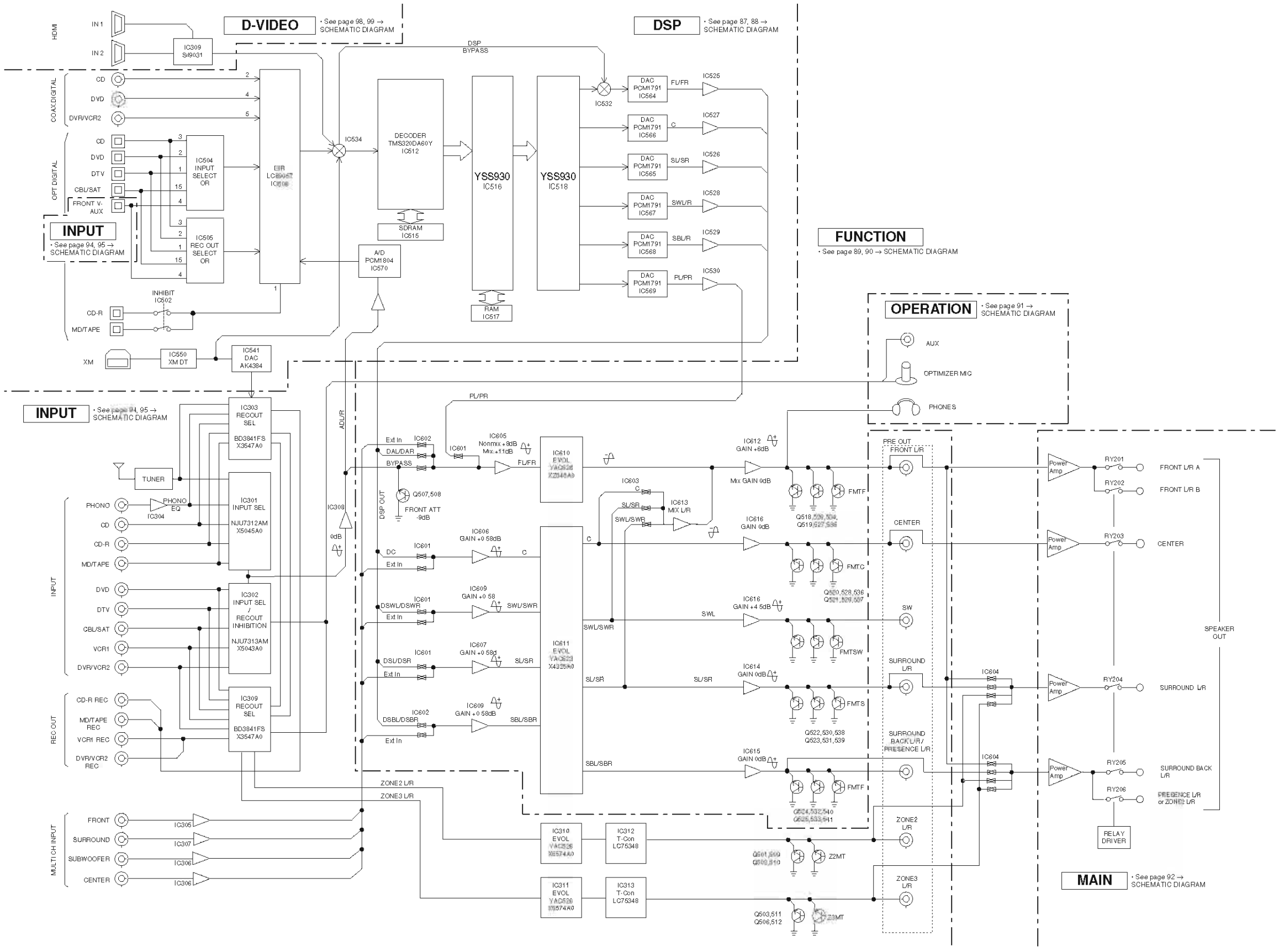
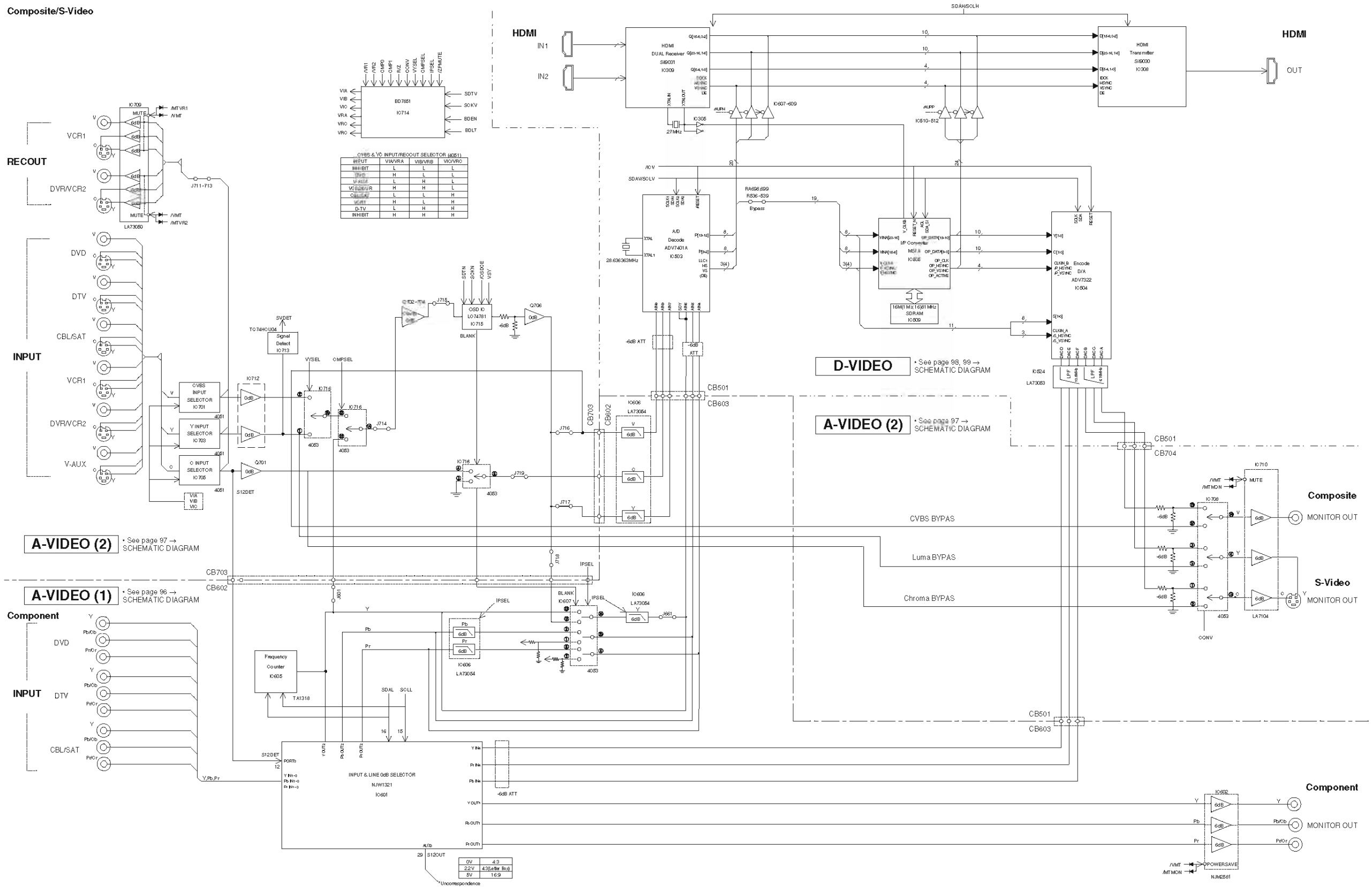
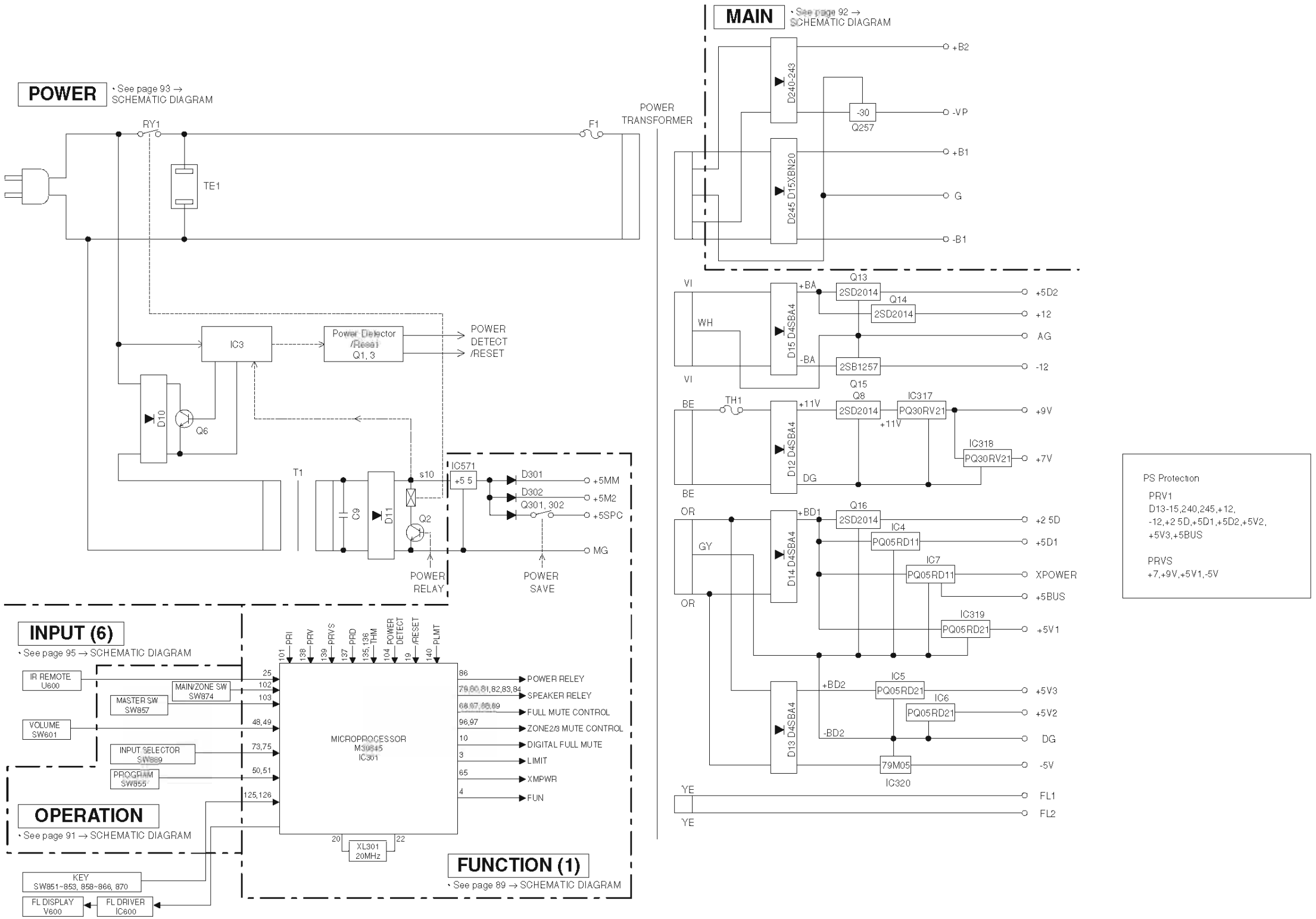
■ BLOCK DIAGRAM (1/3)



■ BLOCK DIAGRAM (2/3)



■ BLOCK DIAGRAM (3/3)



PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

- Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

C.A.EL.CHP	: CHIP ALUMI.ELECTROLYTIC CAP
C.CE	: CERAMIC CAP
C.CE.ARRAY	: CERAMIC CAP ARRAY
C.CE.CHP	: CHIP CERAMIC CAP
C.CE.ML	: MULTILAYER CERAMIC CAP
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP
C.CE.TUBLR	: CERAMIC TUBULAR CAP
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP
C.EL	: ELECTROLYTIC CAP
C.MICA	: MICA CAP
C.ML.FLM	: MULTILAYER FILM CAP
C.MP	: METALLIZED PAPER CAP
C.MYLAR	: MYLAR FILM CAP
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP
C.PAPER	: PAPER CAPACITOR
C.PLS	: POLYSTYRENE FILM CAP
C.POL	: POLYESTER FILM CAP
C.POLY	: POLYETHYLENE FILM CAP
C.PP	: POLYPROPYLENE FILM CAP
C.TNTL	: TANTALUM CAP
C.TNTL.CHP	: CHIP TANTALUM CAP
C.TRIM	: TRIMMER CAP
CN	: CONNECTOR
CN.BS.PIN	: CONNECTOR,BASE PIN
CN.CANNON	: CONNECTOR,CANNON
CN.DIN	: CONNECTOR,DIN
CN.FLAT	: CONNECTOR,FLAT CABLE
CN.POST	: CONNECTOR,BASE POST
COIL.MX.AM	: COIL,AM MIX
COIL.AT.FM	: COIL,FM ANTENNA
COIL.DT.FM	: COIL,FM DETECT
COIL.MX.FM	: COIL,FM MIX
COIL,OUTPT	: OUTPUT COIL
DIOD.ARRAY	: DIODE ARRAY
DIODE.BRG	: DIODE BRIDGE
DIODE.CHP	: CHIP DIODE
DIODE.VAR	: VARACTOR DIODE
DIOD.Z.CHP	: CHIP ZENER DIODE
DIODE.ZENR	: ZENER DIODE
DSCR.CE	: CERAMIC DISCRIMINATOR
FER.BEAD	: FERRITE BEADS
FER.CORE	: FERRITE CORE
FET.CHP	: CHIP FET
FL.DSPLY	: FLUORESCENT DISPLAY
FLTR.CE	: CERAMIC FILTER
FLTR.COMB	: COMB FILTER MODULE
FLTR.LC.RF	: LC FILTER,EMI
GND.MTL	: GROUND PLATE
GND.TERM	: GROUND TERMINAL
HOLDER.FUS	: FUSE HOLDER
IC.PRTCT	: IC PROTECTOR
JUMPER.CN	: JUMPER CONNECTOR
JUMPER.TST	: JUMPER,TEST POINT
L.DTCT	: LIGHT DETECTING MODULE
L.EMIT	: LIGHT EMITTING MODULE
LED.DSPLY	: LED DISPLAY
LED.INFRD	: LED,INFRARED
MODUL.RF	: MODULATOR,RF
PHOT.CPL	: PHOTO COUPLER
PHOT.INTR	: PHOTO INTERRUPTER
PHOT.RFLCT	: PHOTO REFLECTOR
PIN.TEST	: PIN,TEST POINT
PLST.RIVET	: PLASTIC RIVET
R.ARRAY	: RESISTOR ARRAY
R.CAR.	: CARBON RESISTOR
R.CAR.CHP	: CHIP RESISTOR
R.CAR.FP	: FLAME PROOF CARBON RESISTOR
R.FUS	: FUSABLE RESISTOR
R.MTL.CHP	: CHIP METAL FILM RESISTOR
R.MTL.FLM	: METAL FILM RESISTOR
R.MTL.OXD	: METAL OXIDE FILM RESISTOR
R.MTL.PLAT	: METAL PLATE RESISTOR
RSNR.CE	: CERAMIC RESONATOR
RSNR.CRYS	: CRYSTAL RESONATOR
R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
R.CEMENT	: CEMENT RESISTOR
SCR.BND.HD	: BIND HEAD B-TITE SCREW
SCR.BW.HD	: BW HEAD TAPPING SCREW
SCR.CUP	: CUP TITE SCREW
SCR.TERM	: SCREW TERMINAL
SCR.TR	: SCREW,TRANSISTOR
SUPRT.PCB	: SUPPORT,P.C.B.
SURG.PRTCT	: SURGE PROTECTOR
SW.TACT	: TACT SWITCH
SW.LEAF	: LEAF SWITCH
SW.LEVER	: LEVER SWITCH
SW.MICRO	: MICRO SWITCH
SW.PUSH	: PUSH SWITCH
SW.RT.ENC	: ROTARY ENCODER
SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
SW.RT	: ROTARY SWITCH
SW.SLIDE	: SLIDE SWITCH
TERM.SP	: SPEAKER TERMINAL
TERM.WRAP	: WRAPPING TERMINAL
THRMST.CHP	: CHIP THERMISTOR
TR.CHP	: CHIP TRANSISTOR
TR.DGT	: DIGITAL TRANSISTOR
TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
TRANS	: TRANSFORMER
TRANS.PULS	: PULSE TRANSFORMER
TRANS.PWR	: POWER TRANSFORMER ASS'Y
TUNER.AM	: TUNER PACK,AM
TUNER.FM	: TUNER PACK,FM
TUNER.PK	: FRONT-ENDTUNER PACK
VR	: ROTARY POTENTIOMETER
VR.MTR	: POTENTIOMETER WITH MOTOR
VR.SW	: POTENTIOMETER WITH ROTARY SW
VR.SLIDE	: SLIDE POTENTIOMETER
VR.TRIM	: TRIMMER POTENTIOMETER

P.C.B. DSP

	Ref. No.	Part No.	Description		Markets
*		WG078400	P.C.B.	DSP	
*	CB1	WE161800	CN	CAM-C16 4P SE	
	CB2	VF982300	CN.BS.PIN	17P	
	CB3	VB858700	CN.BS.PIN	8P	
	CB4-5	V9356900	CN	JE 19P SE	
	CB21	V9356900	CN	JE 19P SE	
	CB22	VQ044900	CN.BS.PIN	19P	
	C5	US035100	C.CE.CHP	0.1uF 16V B	
	C6	US035100	C.CE.CHP	0.1uF 16V B	
	C7	US060500	C.CE.CHP	5pF 50V B	
	C8	US035100	C.CE.CHP	0.1uF 16V B	
	C9	US060500	C.CE.CHP	5pF 50V B	
	C10-16	US035100	C.CE.CHP	0.1uF 16V B	
	C17	US061470	C.CE.CHP	47pF 50V B	
	C20	US061470	C.CE.CHP	47pF 50V B	
	C23	US061470	C.CE.CHP	47pF 50V B	
	C24-25	US035100	C.CE.CHP	0.1uF 16V B	
	C26	US135100	C.CE.CHP	0.1uF 16V	
	C29	US061470	C.CE.CHP	47pF 50V B	
	C30	US061470	C.CE.CHP	47pF 50V B	
	C31-33	US061220	C.CE.CHP	22pF 50V B	
	C34-39	US135100	C.CE.CHP	0.1uF 16V	
	C40-42	US135100	C.CE.CHP	0.1uF 16V	
	C43-45	UR237220	C.EL	22uF 16V	
	C46	UU238330	C.EL	330uF 16V	
	C47	UR237470	C.EL	47uF 16V	
	C48	US135100	C.CE.CHP	0.1uF 16V	
	C49	UR237470	C.EL	47uF 16V	
	C50-52	US135100	C.CE.CHP	0.1uF 16V	
	C53	UR237220	C.EL	22uF 16V	
	C54-55	US135100	C.CE.CHP	0.1uF 16V	
	C57	US135100	C.CE.CHP	0.1uF 16V	
	C58	UU238100	C.EL	100uF 16V	
	C59	UR218100	C.EL	100uF 6.3V	
	C60	US135100	C.CE.CHP	0.1uF 16V	
	C62-63	US135100	C.CE.CHP	0.1uF 16V	
	C64	VE326000	C.MYLAR	0.1uF 50V	
	C65	VE326600	C.MYLAR	0.33uF 50V J	
	C66	UA654220	C.MYLAR	0.022uF 50V J	
	C68	UR237470	C.EL	47uF 16V	
	C69	US135100	C.CE.CHP	0.1uF 16V	
	C70	US135100	C.CE.CHP	0.1uF 16V	
	C71	UR218100	C.EL	100uF 6.3V	
	C72	US135100	C.CE.CHP	0.1uF 16V	
	C74-75	US135100	C.CE.CHP	0.1uF 16V	
	C76	UU238100	C.EL	100uF 16V	
	C78	US135100	C.CE.CHP	0.1uF 16V	
	C80	UU267470	C.EL	47uF 50V	

* New Parts

P.C.B. DSP

Ref. No.	Part No.	Description			Markets
C81	US061470	C.CE.CHP	47pF	50V B	
C82	US135100	C.CE.CHP	0.1uF	16V	
C83	UU267470	C.EL	47uF	50V	
C84	UU238100	C.EL	100uF	16V	
C85-89	US135100	C.CE.CHP	0.1uF	16V	
C90	US063100	C.CE.CHP	1000pF	50V B	
C91-93	US135100	C.CE.CHP	0.1uF	16V	
C94	UU219100	C.EL	1000uF	6.3V	
C95	UU267470	C.EL	47uF	50V	
C97	UR237100	C.EL	10uF	16V	
C98-99	US135100	C.CE.CHP	0.1uF	16V	
C100-118	US135100	C.CE.CHP	0.1uF	16V	
C119	UR237100	C.EL	10uF	16V	
C120	US126100	C.CE.CHP	1uF	10V	
C121-122	US135100	C.CE.CHP	0.1uF	16V	
C125	US135100	C.CE.CHP	0.1uF	16V	
C126	US062100	C.CE.CHP	100pF	50V B	
C129-131	US135100	C.CE.CHP	0.1uF	16V	
C132	UR237100	C.EL	10uF	16V	
C133-138	US135100	C.CE.CHP	0.1uF	16V	
C143-146	US135100	C.CE.CHP	0.1uF	16V	
C147-153	US061470	C.CE.CHP	47pF	50V B	
C154-170	US135100	C.CE.CHP	0.1uF	16V	
C171	UR238100	C.EL	100uF	16V	
C172	UU238100	C.EL	100uF	16V	
C173-174	US135100	C.CE.CHP	0.1uF	16V	
C175-177	US063100	C.CE.CHP	1000pF	50V B	
C178-179	US135100	C.CE.CHP	0.1uF	16V	
C180-182	US063100	C.CE.CHP	1000pF	50V B	
C183-184	US135100	C.CE.CHP	0.1uF	16V	
C185	UU238100	C.EL	100uF	16V	
C186	US035100	C.CE.CHP	0.1uF	16V B	
C187	UR237100	C.EL	10uF	16V	
C188	UR237220	C.EL	22uF	16V	
C189-190	US135100	C.CE.CHP	0.1uF	16V	
C191	UU267100	C.EL	10uF	50V	
C192	US135100	C.CE.CHP	0.1uF	16V	
C193	UU267100	C.EL	10uF	50V	
C194-198	US135100	C.CE.CHP	0.1uF	16V	
C199	UR237220	C.EL	22uF	16V	
C200	US135100	C.CE.CHP	0.1uF	16V	
C201	UU267100	C.EL	10uF	50V	
C202	US135100	C.CE.CHP	0.1uF	16V	
C203	UU267100	C.EL	10uF	50V	
C204	US135100	C.CE.CHP	0.1uF	16V	
C205-208	UA652100	C.MYLAR	100pF	50V J	
C209	US135100	C.CE.CHP	0.1uF	16V	
C210	US063470	C.CE.CHP	4700pF	50V B	

* New Parts

P.C.B. DSP

Ref. No.	Part No.	Description			Markets
C211-212	UA654220	C.MYLAR	0.022uF	50V J	
C213	US062470	C.CE.CHP	470pF	50V B	
C214	US135100	C.CE.CHP	0.1uF	16V	
C215-218	UA652470	C.MYLAR	470pF	50V J	
C219	UR237100	C.EL	10uF	16V	
C220-221	US135100	C.CE.CHP	0.1uF	16V	
C222-224	UU267100	C.EL	10uF	50V	
C225-227	US135100	C.CE.CHP	0.1uF	16V	
C228	UU267100	C.EL	10uF	50V	
C229	US135100	C.CE.CHP	0.1uF	16V	
C230	UR237100	C.EL	10uF	16V	
C231	UR237220	C.EL	22uF	16V	
C232-233	UU267220	C.EL	22uF	50V	
C234-235	US135100	C.CE.CHP	0.1uF	16V	
C236-237	UR237470	C.EL	47uF	16V	
C238-241	US135100	C.CE.CHP	0.1uF	16V	
C242-243	US064100	C.CE.CHP	0.01uF	50V B	
C244	US063470	C.CE.CHP	4700pF	50V B	
C245	US062470	C.CE.CHP	470pF	50V B	
C246-251	US135100	C.CE.CHP	0.1uF	16V	
C252	UR237100	C.EL	10uF	16V	
C253	UR837100	C.EL	10uF	16V	
C254	US135100	C.CE.CHP	0.1uF	16V	
C256	UR837470	C.EL	47uF	16V	
C257	US135100	C.CE.CHP	0.1uF	16V	
C258	US135100	C.CE.CHP	0.1uF	16V	
C259-260	UR837470	C.EL	47uF	16V	
C261-263	US135100	C.CE.CHP	0.1uF	16V	
C264-265	UR837100	C.EL	10uF	16V	
C268-269	US135100	C.CE.CHP	0.1uF	16V	
C270-271	UR837470	C.EL	47uF	16V	
C272	US135100	C.CE.CHP	0.1uF	16V	
C274	UU238100	C.EL	100uF	16V	
C279	US135100	C.CE.CHP	0.1uF	16V	
C283-288	US135100	C.CE.CHP	0.1uF	16V	
C289-294	UU238100	C.EL	100uF	16V	
C295-299	US135100	C.CE.CHP	0.1uF	16V	
C300	US135100	C.CE.CHP	0.1uF	16V	
C301-306	UU267100	C.EL	10uF	50V	
C307-312	UU238100	C.EL	100uF	16V	
C313-318	US135100	C.CE.CHP	0.1uF	16V	
C319-323	UA652560	C.MYLAR	560pF	50V J	
C324-328	UA653680	C.MYLAR	6800pF	50V J	
C329-330	UA654560	C.MYLAR	0.056uF	50V J	
C331-334	UA653680	C.MYLAR	6800pF	50V J	
C335-339	UA652390	C.MYLAR	390pF	50V J	
C340-341	UA654150	C.MYLAR	0.015uF	50V J	
C342-350	UA652390	C.MYLAR	390pF	50V J	

* New Parts

P.C.B. DSP

Ref. No.	Part No.	Description			Markets
C351-352	UA654150	C.MYLAR	0.015uF	50V J	
C353-356	UA652390	C.MYLAR	390pF	50V J	
C368-374	UU267100	C.EL	10uF	50V	
C375-376	UR237100	C.EL	10uF	16V	
C377-378	UU267100	C.EL	10uF	50V	
C379-390	US135100	C.CE.CHP	0.1uF	16V	
C391-396	UR237470	C.EL	47uF	16V	
C399	US061470	C.CE.CHP	47pF	50V B	
C400	US061470	C.CE.CHP	47pF	50V B	
C401-409	US135100	C.CE.CHP	0.1uF	16V	
C411-412	US135100	C.CE.CHP	0.1uF	16V	
C413-419	US163100	C.CE.CHP	1000pF	50V	
C423	US063100	C.CE.CHP	1000pF	50V B	
C426	UR238100	C.EL	100uF	16V	
C531-534	UA653270	C.MYLAR	2700pF	50V J	
C535-548	US061470	C.CE.CHP	47pF	50V B	
C551-573	US135100	C.CE.CHP	0.1uF	16V	
C574-594	US163100	C.CE.CHP	1000pF	50V	
C595-599	US135100	C.CE.CHP	0.1uF	16V	
C600-608	US135100	C.CE.CHP	0.1uF	16V	
D1	WE674800	DIODE	AVRL161A1R1NTB		
D2	WE674800	DIODE	AVRL161A1R1NTB		
D3	WE674800	DIODE	AVRL161A1R1NTB		
D5	VT332900	DIODE	1SS355		
D7	VT332900	DIODE	1SS355		
D13	VT332900	DIODE	1SS355		
D14-19	VV220700	DIODE.SHOT	RB501V-40		
D20-23	VV220700	DIODE.SHOT	RB501V-40		
IC501	X3936A00	IC	SN74LVU04APWR		
IC502	X5482A00	IC	NE5532DR OP AMP		
IC504-505	XN518A00	IC	SN74LS151NSR 8-1 S		
* IC506	X6989A00	IC	LC89057W-VF4A-E		
IC507	X5945A00	IC	PQ012FZ01ZPH		
IC508	XZ003A00	IC	PQ025EZ5MZP 2.5V		
IC509	X6051A00	IC	UPC29M33T-E1-AZ		
IC510	X2080A00	IC	SN74AHCT1G32DCKR		
IC511	X3824A00	IC	SN74AHCT08PWR		
IC513	X3693A00	IC	SN74LV245APWR TRAN		
IC514	X6123A00	IC	SN74LV157APWR		
IC515	X2590B00	IC	W9816G6CH-7 SDRAM		
IC516	X3567A00	IC	YSS930-SZ		
IC517	XV077B00	IC	MSM514260E-60JS		
IC518	X3567A00	IC	YSS930-SZ		
IC520	X3505A00	IC	NJM2068MD-TE2		
IC525-530	X3505A00	IC	NJM2068MD-TE2		
IC532	X6123A00	IC	SN74LV157APWR		
IC533-534	XV894A00	IC	TC74VHC153FT MULTI		

* New Parts

P.C.B. DSP & P.C.B. FUNCTION

	Ref. No.	Part No.	Description		Markets
	IC539-540	X3505A00	IC	NJM2068MD-TE2	
*	IC541	X6231A00	IC	AK4384ET	
*	IC542	X7016A00	IC	MX29LV400BC-70G	
*	IC550	X6227B00	IC	F2602E-01	
	IC551	X2080A00	IC	SN74AHCT1G32DCKR	
	IC552	X3693A00	IC	SN74LV245APWR TRAN	
	IC560	X5482A00	IC	NE5532DR OP AMP	
*	IC564-569	X6873A00	IC	PCM1791ADBR	
*	IC570	X6872A00	IC	PCM1804DBR	
	IC571	X3833A00	IC	SN74AHC1G08DCKR	
*	PJ1	WF860400	JACK.PIN	LPR6520-G080FM	
	PN1	V9637500	PIN	L=70 #18	
	Q6	VD303700	TR	2SC3326 A,B	
	Q19	VV655400	TR.DGT	DTC114EKA	
	R41-42	HV753100	R.CAR.FP	1Ω 1/4W	
	R52-53	HV753100	R.CAR.FP	1Ω 1/4W	
	R59	HV753100	R.CAR.FP	1Ω 1/4W	
	R76	HV753100	R.CAR.FP	1Ω 1/4W	
	R98	HV753100	R.CAR.FP	1Ω 1/4W	
	R252-253	VP939600	R.MTL.FLM	2.2Ω 1W	
	R273	HV753100	R.CAR.FP	1Ω 1/4W	
	R296	HV753100	R.CAR.FP	1Ω 1/4W	
	R298	HV753100	R.CAR.FP	1Ω 1/4W	
	R365-374	HV753470	R.CAR.FP	4.7Ω 1/4W	
	R398-399	HV753470	R.CAR.FP	4.7Ω 1/4W	
	U1	WB920900	CN.PHOT.SN	1P GP1FA513TZ0F	
	U2	WB920900	CN.PHOT.SN	1P GP1FA513TZ0F	
	U3	WB547900	CN.PHOT.SN	1P GP1FA513RZ0F	
	U4	WB547900	CN.PHOT.SN	1P GP1FA513RZ0F	
	U5	WB547900	CN.PHOT.SN	1P GP1FA513RZ0F	
	U6	WB547900	CN.PHOT.SN	1P GP1FA513RZ0F	
*	XL1	WE436500	RSNR.CRYS	45.1584MHz DSX840GA	
	XL2	V6931900	RESONATOR	24.576MHz DS0751SV	
*		WG080800	P.C.B.	FUNCTION	
	CB301	VB858700	CN.BS.PIN	8P	
	CB303	VM929900	CN.BS.PIN	15P	
	CB304	VQ046000	CN.BS.PIN	31P	
	CB305	VB858800	CN.BS.PIN	9P	
	CB306	LB919060	CN.BS.PIN	6P	
*	CB307	V8810200	CN	JE 9P TE	
*	CB308	VU446000	CN	JE 15P TE	
	CB309-310	V8875600	CN	JE 13P TE	
	CB311	V7826400	CN	14P TE TUC SERIES	
	CB312	V7826100	CN	11P TE TUC SERIES	
	CB313	V8875600	CN	JE 13P TE	

* New Parts

P.C.B. FUNCTION

	Ref. No.	Part No.	Description		Markets
	CB314-315	V9357000	CN	JE 19P TE	
*	CB316	VU446000	CN	JE 15P TE	
	CB317-319	V9357000	CN	JE 19P TE	
*	CB601	VU443800	CN	JE 15P SE	
	CB602	VB390100	CN.BS.PIN	5P	
	CB603	VB390500	CN.BS.PIN	9P	
	CB604	VQ047400	CN.BS.PIN	19P	
	CB605	LB919040	CN.BS.PIN	4P	
	CB606	VB389800	CN.BS.PIN	2P	
	CB607	VB390200	CN.BS.PIN	6P	
	CB608	LB918020	CN.BS.PIN	2P	
	C301	UR239100	C.EL	1000uF 16V	
	C303	US063100	C.CE.CHP	1000pF 50V B	
	C304	UR067100	C.EL	10uF 50V	
	C305	WB165500	C.EL	0.33F 5.5V	
	C306-307	UR219100	C.EL	1000uF 6.3V	
	C308	US064100	C.CE.CHP	0.01uF 50V B	
	C309	UR238100	C.EL	100uF 16V	
	C310-326	US135100	C.CE.CHP	0.1uF 16V	
	C327-334	UR266220	C.EL	2.2uF 50V	
	C335	UR239100	C.EL	1000uF 16V	
	C338	US064100	C.CE.CHP	0.01uF 50V B	
	C339	UR266220	C.EL	2.2uF 50V	
	C340	UR237470	C.EL	47uF 16V	
	C351	US135100	C.CE.CHP	0.1uF 16V	
	C352	UR267470	C.EL	47uF 50V	
	C353	UR237470	C.EL	47uF 16V	
	C354	US135100	C.CE.CHP	0.1uF 16V	
	C355-356	UR267470	C.EL	47uF 50V	
	C358-359	US062100	C.CE.CHP	100pF 50V B	
	C361-362	US062100	C.CE.CHP	100pF 50V B	
	C365-366	US062100	C.CE.CHP	100pF 50V B	
	C368-375	US062100	C.CE.CHP	100pF 50V B	
	C378-388	US062100	C.CE.CHP	100pF 50V B	
	C392	US062100	C.CE.CHP	100pF 50V B	
	C394-399	US062100	C.CE.CHP	100pF 50V B	
	C400-402	US062100	C.CE.CHP	100pF 50V B	
	C403	US135100	C.CE.CHP	0.1uF 16V	
	C404	UR218220	C.EL	220uF 6.3V	
	C405	US135100	C.CE.CHP	0.1uF 16V	
	C406-407	US064100	C.CE.CHP	0.01uF 50V B	
	C408-409	US062100	C.CE.CHP	100pF 50V B	
	C410-413	US135100	C.CE.CHP	0.1uF 16V	
	C601-602	UR237100	C.EL	10uF 16V	
	C603	US135220	C.CE.CHP	0.22uF 16V	
	C604-605	US135100	C.CE.CHP	0.1uF 16V	
	C606-607	UR267470	C.EL	47uF 50V	
	C608	US135100	C.CE.CHP	0.1uF 16V	

* New Parts

P.C.B. FUNCTION

Ref. No.	Part No.	Description			Markets
C609-612	UR237100	C.EL	10uF	16V	
C613	US135100	C.CE.CHP	0.1uF	16V	
C614-618	UR237100	C.EL	10uF	16V	
C619-625	UR238100	C.EL	100uF	16V	*
C626-627	US062100	C.CE.CHP	100pF	50V B	
C628-630	UT952100	C.PP	100pF	100V	
C631-634	US062100	C.CE.CHP	100pF	50V B	
C635-636	UR266470	C.EL	4.7uF	50V	
C637-638	UR267470	C.EL	47uF	50V	
C639	UR266470	C.EL	4.7uF	50V	
C640-641	UR237100	C.EL	10uF	16V	*
C642-643	UR266470	C.EL	4.7uF	50V	
C644-645	UR266330	C.EL	3.3uF	50V	
C646-651	US135100	C.CE.CHP	0.1uF	16V	
C652	UR237470	C.EL	47uF	16V	
C653	US135100	C.CE.CHP	0.1uF	16V	
C654	WG781200	C.EL	33uF	25V	
C655	UR267470	C.EL	47uF	50V	
C656	WG782300	C.EL	10uF	50V	
C657	WG781200	C.EL	33uF	25V	
C658	UR237470	C.EL	47uF	16V	
C659	WG781200	C.EL	33uF	25V	
C660	UR237100	C.EL	10uF	16V	*
C661	WG781200	C.EL	33uF	25V	
C662	UR267470	C.EL	47uF	50V	
C663-665	WG781200	C.EL	33uF	25V	
C666	US135100	C.CE.CHP	0.1uF	16V	
C667-668	UR237470	C.EL	47uF	16V	
C669-670	US061470	C.CE.CHP	47pF	50V B	
C671	US062100	C.CE.CHP	100pF	50V B	
C672-673	UR237100	C.EL	10uF	16V	
C674-675	UT952100	C.PP	100pF	100V	
C676-681	UU267100	C.EL	10uF	50V	
C682-683	UR267470	C.EL	47uF	50V	
C684	UR237220	C.EL	22uF	16V	
C685-686	UU267100	C.EL	10uF	50V	*
C687	UR237220	C.EL	22uF	16V	
C688-689	US135100	C.CE.CHP	0.1uF	16V	
C690-691	UR267470	C.EL	47uF	50V	
C693	US135100	C.CE.CHP	0.1uF	16V	*
C695	US135100	C.CE.CHP	0.1uF	16V	
D301	VV833200	DIODE	1SS380		
D302-307	VT332900	DIODE	1SS355		
D308	VU992600	DIODE.ZENR	MA8051-M	5.1V	
D309-310	VT332900	DIODE	1SS355		
D311	VU172000	DIODE.ZENR	UDZS5.6BTE-17	5.6V	
D312	VU993700	DIODE.ZENR	MA8068-L	6.6V	
D313	VU995300	DIODE.ZENR	MA8100-L	9.7V	

* New Parts

P.C.B. FUNCTION & OPERATION

Ref. No.	Part No.	Description			Markets
D314	VU993700	DIODE.ZENR	MA8068-L	6.6V	
D601-604	VT332900	DIODE	1SS355		
D605-606	VU993700	DIODE.ZENR	MA8068-L	6.6V	
IC301	X7014A00	IC CPU	M30845FJGP		(unwritten)
IC571	X5886A00	IC	RH5RE58AA-T1-FA		
IC601	X5044A00	IC	NJU7311AM		
IC602	X5045A00	IC	NJU7312AM		
IC603	X5044A00	IC	NJU7311AM		
IC604	X5043A00	IC	NJU7313AM		
IC605-609	X3505A00	IC	NJM2068MD-TE2		
IC610	X5574A00	IC	YAC526-EZE2		
IC611	X4325A00	IC	YAC523-EVR2		
IC612	XF291A00	IC	uPC4570G2		
IC613	X3505A00	IC	NJM2068MD-TE2		
IC614	XF291A00	IC	uPC4570G2		
IC616	XF291A00	IC	uPC4570G2		
PN301	V9637500	PIN	L=70 #18		
PN601-606	V9637500	PIN	L=70 #18		
Q301	WD974200	TR	2SA1036KT146 P,Q,R		
Q302	VV556500	TR	2SA1037K Q,R,S		
Q303-306	VD303700	TR	2SC3326 A,B		
Q307	iC287820	TR	2SC2878 A,B		
Q308-315	WF767900	FET	5HP01C-TB-E		
Q323	VD303700	TR	2SC3326 A,B		
Q324	iC181510	TR	2SC1815 Y		
Q326-327	VP872700	TR	2SC4488 S,T		
Q328	VP872600	TR	2SA1708 S,T		
Q603	VP872700	TR	2SC4488 S,T		
Q604	VP872600	TR	2SA1708 S,T		
Q605-606	VZ725900	TR	2SD1938F S,T		
Q609-610	VZ725900	TR	2SD1938F S,T		
Q613-628	VZ725900	TR	2SD1938F S,T		
R301	VP939800	R.MTL.OXD	10Ω	1W	
R677-678	V8070200	R.MTL.FLM	4.7Ω	1W	
R723	HF355330	R.CAR	330Ω	1/2W	
XL301	WF997400	RSNR.CE	20MHz		
	WG083600	P.C.B.	OPERATION		
CB901	VB389800	CN.BS.PIN	2P		
CB902	VB390200	CN.BS.PIN	6P		
CB903	VB858500	CN.BS.PIN	6P		
CB904	VB390000	CN.BS.PIN	4P		
CB905	VB389900	CN.BS.PIN	3P		
CB906	VB390200	CN.BS.PIN	6P		
CB907-908	VB390300	CN.BS.PIN	7P		
CB911	V7825900	CN	9P TE TUC SERIES		

* New Parts

P.C.B. OPERATION

Ref. No.	Part No.	Description			Markets
CB912	VQ046000	CN. BS. PIN	31P		
CB913	VP798200	CN. BS. PIN	24P		
C857-858	US063100	C. CE. CHP	1000pF	50V B	
C883-884	US063100	C. CE. CHP	1000pF	50V B	
C899	US135100	C. CE. CHP	0.1uF	16V	
C900-901	UR237220	C. EL	22uF	16V	
C902	US135100	C. CE. CHP	0.1uF	16V	
C903	UR237100	C. EL	10uF	16V	
C904	UA653100	C. MYLAR	1000pF	50V J	
C905	US064100	C. CE. CHP	0.01uF	50V B	
C906	UA653100	C. MYLAR	1000pF	50V J	
C907-908	UR237100	C. EL	10uF	16V	
C909	US061330	C. CE. CHP	33pF	50V B	
C910	US135100	C. CE. CHP	0.1uF	16V	
C911	UR817470	C. EL	47uF	6.3V	
C912	UR237470	C. EL	47uF	16V	
C913-914	US062470	C. CE. CHP	470pF	50V B	
C915	US063100	C. CE. CHP	1000pF	50V B	
C916-917	US062100	C. CE. CHP	100pF	50V B	
C918	US135100	C. CE. CHP	0.1uF	16V	
C919-920	US062100	C. CE. CHP	100pF	50V B	
C921	UR237220	C. EL	22uF	16V	
C922-923	US135100	C. CE. CHP	0.1uF	16V	
C924-925	UR237100	C. EL	10uF	16V	
C926	US135100	C. CE. CHP	0.1uF	16V	
C927	US062100	C. CE. CHP	100pF	50V B	
C928-929	US061100	C. CE. CHP	10pF	50V B	
C930	UR237100	C. EL	10uF	16V	
C931-932	WB553000	C. EL	1000uF	16V	
C933	US063100	C. CE. CHP	1000pF	50V B	
C934	US064100	C. CE. CHP	0.01uF	50V B	
C941-942	US135100	C. CE. CHP	0.1uF	16V	
C945	US135100	C. CE. CHP	0.1uF	16V	
C954-958	US135100	C. CE. CHP	0.1uF	16V	
D860	VU171900	DIODE. ZENR	UDZ5.1B	5.1V	
D861-862	VV307700	DIODE	1N4002S		
D868	WB071400	LED	BE SLR343BBT		
D872-878	VT332900	DIODE	1SS355		
IC853	X2080A00	IC	SN74AHCT1G32DCKR		
IC854	XS377A00	IC	BA15218F OP AMP		
IC855	XF291A00	IC	uPC4570G2		
JK858	V9408200	JACK. PHONE	MSJ-064-05B GR		
JK859	V2589500	CN. DIN	1P		
JK860	WC814400	JACK. MNI	JY-3554-01-130		
PJ854	V7190100	JACK. PIN	3P		
PN901-903	V9637500	PIN	L=70 #18		
Q864-865	VZ725900	TR	2SD1938F S,T		
Q866	VV556400	TR	2SC2412K Q,R,S		

* New Parts

P.C.B. OPERATION & P.C.B. MAIN

Ref. No.	Part No.	Description			Markets
Q868	VV655400	TR. DGT	DTC114EKA		
R932-933	HF355100	R. CAR	100 Ω	1/2W	
R955-956	HL005220	R. MTL. OXD	220 Ω	1/2W	
ST853-854	WA246200	SCR. TERM	3.5		
ST855-856	V4040500	SCR. TERM	M3		
ST857	WA246200	SCR. TERM	3.5		
SW851-853	V4757100	SW. TACT	EVQ11A		
SW855	V9281200	SW. RT. ENC	EVEGC1F2512B		
SW856	V4757100	SW. TACT	EVQ11A		
SW857	WF875900	SW. PUSH	SPUN127100		
SW858-866	V4757100	SW. TACT	EVQ11A		
SW869	V9281200	SW. RT. ENC	EVEGC1F2512B		
SW870-874	V4757100	SW. TACT	EVQ11A		
U852	WB547900	CN. PHOT. SN	1P GP1FA513RZ0F		
*	WG075500	P. C. B.	MAIN		
CB205	V7825800	CN	8P TE TUC SERIES		
CB206	V7825500	CN	5P TE TUC SERIES		
CB208	LB918030	CN. BS. PIN	3P		
CB211	WB127100	CN. BS. PIN	3P TE XH		
CB212	LB932060	CN. BS. PIN	6P		
CB215	VB390300	CN. BS. PIN	7P		
CB216	LB918020	CN. BS. PIN	2P		
CB217	V7826100	CN	11P TE TUC SERIES		
CB218	V7825400	CN	4P TE TUC SERIES		
CB219	VB390400	CN. BS. PIN	8P		
C201	VJ599100	C. CE. TUBLR	0.1uF	50V	
C202	WE100900	C. PP	220pF	630V	
C226	VJ599100	C. CE. TUBLR	0.1uF	50V	
C234	WE100500	C. PP	100pF	630V	
C235	UR297100	C. EL	10uF	100V	
C236-237	WE100500	C. PP	100pF	630V	
C238	UR297100	C. EL	10uF	100V	
C239-240	WE100500	C. PP	100pF	630V	
C241	UR397100	C. EL	10uF	100V	
C242-243	WE100500	C. PP	100pF	630V	
C244	UR397100	C. EL	10uF	100V	
C245-246	WE100500	C. PP	100pF	630V	
C247	UR297100	C. EL	10uF	100V	
C248-249	WE100500	C. PP	100pF	630V	
C250	UR297100	C. EL	10uF	100V	
C251-252	WE100500	C. PP	100pF	630V	
C253	UR297100	C. EL	10uF	100V	
C254	WE100500	C. PP	100pF	630V	
C255-256	VR169100	C. MYLAR	0.39uF	50V	
C257	VR325300	C. MYLAR	0.047uF	100V	

* New Parts

P.C.B. MAIN

	Ref. No.	Part No.	Description			Markets
	C258	VR325300	C.MYLAR	0.047uF	100V	
	C259-260	UA654470	C.MYLAR	0.047uF	50V J	
	C261	VR325300	C.MYLAR	0.047uF	100V	
	C262	VR325300	C.MYLAR	0.047uF	100V	
	C263	VR325300	C.MYLAR	0.047uF	100V	
	C264-269	UR297100	C.EL	10uF	100V	
	C270	UR266470	C.EL	4.7uF	50V	
	C271	UR267330	C.EL	33uF	50V	
	C275-278	UA654100	C.MYLAR	0.01uF	50V J	
	C279	UA654220	C.MYLAR	0.022uF	50V J	
	C280-281	UA654100	C.MYLAR	0.01uF	50V J	
*	C283-284	WG001700	C.EL	12000uF	71V	
	C286	UR268330	C.EL	330uF	50V	
	C287	UR268100	C.EL	100uF	50V	
	C288-289	VR324900	C.MYLAR	0.1uF	100V	
	C290-295	UA654220	C.MYLAR	0.022uF	50V J	
	C296-297	UA654100	C.MYLAR	0.01uF	50V J	
	C299	UA654100	C.MYLAR	0.01uF	50V J	
	C300	UA654100	C.MYLAR	0.01uF	50V J	
	C301	VR324900	C.MYLAR	0.1uF	100V	
	C302	VR324900	C.MYLAR	0.1uF	100V	
	C303-304	UA654220	C.MYLAR	0.022uF	50V J	
	C305	UA654100	C.MYLAR	0.01uF	50V J	
	C350-356	UA654100	C.MYLAR	0.01uF	50V J	
	D207-213	VD631600	DIODE	1SS133,176		
	D214-222	WA180300	DIODE	1SS244		
	D225	VM976300	DIODE.ZENR	HZS242TD	24V	
	D227	VM976300	DIODE.ZENR	HZS242TD	24V	
	D228	VG443700	DIODE.ZENR	MTZJ33B	33V	
	D231	VM976300	DIODE.ZENR	HZS242TD	24V	
	D233	VM976300	DIODE.ZENR	HZS242TD	24V	
	D235	VM976300	DIODE.ZENR	HZS242TD	24V	
	D238	VM976300	DIODE.ZENR	HZS242TD	24V	
⚠	D240-243	VS997800	DIODE	1T2		
⚠	D246	VZ755200	DIODE.BRG	D15XB20	15A 200V	
	D247-253	VD631600	DIODE	1SS133,176		
	D270-276	VG437500	DIODE.ZENR	MTZJ5.1C	5.1V	
	G201	V5995800	PLATE.GND			
	IC201-202	X0515A00	IC	LM61CIZ THERMAL		
	PN201-208	V9637500	PIN	L=70 #18		
⚠	Q213-214	VK432900	TR	2SD1915F S,T		
⚠	Q215-216	iC224030	TR	2SC2240 GR,BL		
⚠	Q217-219	VK432900	TR	2SD1915F S,T		
⚠	Q220A	iX632610	TR	2SA1837 O,Y		
⚠	Q220C	iX632620	TR	2SC4793 O,Y		
⚠	Q221A	iX632610	TR	2SA1837 O,Y		
⚠	Q221C	iX632620	TR	2SC4793 O,Y		
⚠	Q222A	iX632610	TR	2SA1837 O,Y		

* New Parts

P.C.B. MAIN

	Ref. No.	Part No.	Description			Markets
⚠	Q222C	iX632620	TR	2SC4793 O,Y		
⚠	Q223A	iX632610	TR	2SA1837 O,Y		
⚠	Q223C	iX632620	TR	2SC4793 O,Y		
⚠	Q224A	iX632610	TR	2SA1837 O,Y		
⚠	Q224C	iX632620	TR	2SC4793 O,Y		
⚠	Q225A	iX632610	TR	2SA1837 O,Y		
⚠	Q225C	iX632620	TR	2SC4793 O,Y		
⚠	Q226A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q226C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q227A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q227C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q228A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q228C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q229A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q229C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q230A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q230C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q231A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q231C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q232A	iX606460	TR	2SA1492 O,P,Y		
⚠	Q232C	iX606470	TR	2SC3856 O,P,Y		
⚠	Q233A	iX632610	TR	2SA1837 O,Y		
⚠	Q233C	iX632620	TR	2SC4793 O,Y		
	Q248-254	iC224030	TR	2SC2240 GR,BL		
	Q255-256	VP872700	TR	2SC4488 S,T		
	Q257	iA101510	TR	2SA1015 Y		
	Q258	VP872700	TR	2SC4488 S,T		
	Q261-262	VP872700	TR	2SC4488 S,T		
⚠	Q263-269	VR325600	TR	2SC2229 O,Y		
	Q280	VP872700	TR	2SC4488 S,T		
⚠	R201	V3943000	R.MTL.FLM	4.7Ω	1/2W	
	R202-204	HV753470	R.CAR.FP	4.7Ω	1/4W	
	R212-213	HV753470	R.CAR.FP	4.7Ω	1/4W	
	R215-218	HV753470	R.CAR.FP	4.7Ω	1/4W	
⚠	R220	HV753100	R.CAR.FP	1Ω	1/4W	
⚠	R222	HV753100	R.CAR.FP	1Ω	1/4W	
	R263	V3946100	R.MTL.OXD	2.7KΩ	1/2W	
	R264	V3945100	R.MTL.OXD	390Ω	1/2W	
	R265	V3945500	R.MTL.OXD	820Ω	1/2W	
⚠	R266	HV755120	R.CAR.FP	120Ω	1/4W	
	R267	V3946100	R.MTL.OXD	2.7KΩ	1/2W	
	R268	V3945100	R.MTL.OXD	390Ω	1/2W	
	R269	V3945500	R.MTL.OXD	820Ω	1/2W	
⚠	R270	HV755120	R.CAR.FP	120Ω	1/4W	
	R271	V3946100	R.MTL.OXD	2.7KΩ	1/2W	
	R272	V3944900	R.MTL.OXD	270Ω	1/2W	
	R273	V3945600	R.MTL.OXD	1KΩ	1/2W	
⚠	R274	HV755120	R.CAR.FP	120Ω	1/4W	

* New Parts

P.C.B. MAIN & P.C.B. POWER

	Ref. No.	Part No.	Description			Markets
	R275	V3946100	R. MTL. OXD	2.7KΩ	1/2W	
	R276	V3944900	R. MTL. OXD	270Ω	1/2W	
	R277	V3945600	R. MTL. OXD	1KΩ	1/2W	*
⚠	R278	HV755120	R. CAR. FP	120Ω	1/4W	
	R279	V3946100	R. MTL. OXD	2.7KΩ	1/2W	
	R280	V3945100	R. MTL. OXD	390Ω	1/2W	*
	R281	V3945500	R. MTL. OXD	820Ω	1/2W	
⚠	R282	HV755120	R. CAR. FP	120Ω	1/4W	
	R283	V3946100	R. MTL. OXD	2.7KΩ	1/2W	
	R284	V3945100	R. MTL. OXD	390Ω	1/2W	
	R285	V3945500	R. MTL. OXD	820Ω	1/2W	
⚠	R286	HV755120	R. CAR. FP	120Ω	1/4W	
	R287	V3946100	R. MTL. OXD	2.7KΩ	1/2W	
	R288	V3945100	R. MTL. OXD	390Ω	1/2W	
	R289	V3945500	R. MTL. OXD	820Ω	1/2W	
⚠	R290	HV755120	R. CAR. FP	120Ω	1/4W	
	R291-297	V3945600	R. MTL. OXD	1KΩ	1/2W	
⚠	R298-299	HV755220	R. CAR. FP	220Ω	1/4W	
⚠	R300-304	HV755220	R. CAR. FP	220Ω	1/4W	
⚠	R305-318	HV753470	R. CAR. FP	4.7Ω	1/4W	
	R319-320	V3873200	R. CEMENT	0.22Ω	3W	
	R321-322	WB279900	R. CEMENT	RGC55C	0.22+0.22	
	R325	V3873200	R. CEMENT	0.22Ω	3W	
	R326-327	WB279900	R. CEMENT	RGC55C	0.22+0.22	
	R349-355	VP939700	R. MTL. FLM	4.7Ω	1W	
	R363-365	HV754100	R. CAR. FP	10Ω	1/4W	
	R367	HV754100	R. CAR. FP	10Ω	1/4W	
	R371-373	HV754100	R. CAR. FP	10Ω	1/4W	
⚠	R380-382	V3942700	R. MTL. FLM	1Ω	1/2W	
	R387	HV756100	R. CAR. FP	1KΩ	1/4W	
⚠	R389	HV755100	R. CAR. FP	100Ω	1/4W	
⚠	R400-404	HV754820	R. CAR. FP	82Ω	1/4W	
	R422	HV754820	R. CAR. FP	82Ω	1/4W	
	RY201-205	V6322600	RELAY	DC DH24D2-OT(M)-SL		
	RY206	WA544800	RELAY	DC G5PA-28		
	TE201	WD477700	TERM. SP	LTS0810-1019FM		
	TE202	WD756900	TERM. SP	LTS3210-1004FM		
	TE203	WD039300	TERM. SP	LQR2411-0001FM		
	TE204	WD477700	TERM. SP	LTS0810-1019FM		
		VT669300	SCR. BW. HD	3x8-8	MFC2	
*		WG076400	P. C. B.	POWER		
	CB2-3	WC050700	CLIP. FUSE	EYF-52BCY		
	CB4	VS996100	HOLDER. FUS	EYF64BC		
	CB4	VS996100	HOLDER. FUS	EYF64BC		
	CB6	VS996100	HOLDER. FUS	EYF64BC		

* New Parts

P.C.B. POWER

	Ref. No.	Part No.	Description			Markets
	CB6	VS996100	HOLDER. FUS	EYF64BC		
	CB7	VG879900	CN. BS. PIN	2P		
	CB12	LB933030	CN. BS. PIN	3P		
	CB13	LB919090	CN. BS. PIN	9P		
	CB14	VB858400	CN. BS. PIN	5P		
	CB16	LB918100	CN. BS. PIN	10P		
	CB17	LB918050	CN. BS. PIN	5P		
	CB20-21	VB389900	CN. BS. PIN	3P		
	CB40	VB858700	CN. BS. PIN	8P		
	CB41	V7827600	SOCKET	9P SE TUC SERIES		
	CB42	V7827500	SOCKET	8P SE TUC SERIES		
	CB43	V7827200	SOCKET	5P TE TUC SERIES		
	CB44	VB858300	CN. BS. PIN	4P		
	CB46	VB858500	CN. BS. PIN	6P		
	CB47	V7827800	SOCKET	11P SE TUC SERIES		
	CB48	V7827100	SOCKET	4P TE TUC SERIES		
	CB324	VB858200	CN. BS. PIN	3P		
	CB325	VB858300	CN. BS. PIN	4P		
	C1	UR866220	C. EL	2.2uF	50V	
	C2	UR266220	C. EL	2.2uF	50V	
	C3	UA654100	C. MYLAR	0.01uF	50V J	
	C4	WB687100	C. POL. MTL	0.047uF	400V	
	C5	UR266100	C. EL	1uF	50V	
	C6	UA653470	C. MYLAR	4700pF	50V J	
	C7	WB696300	C. POL. MTL	0.1uF	400V	
⚠	C8	V6185300	C. CE. SAFTY	0.01uF	275V	
	C9	WE102900	C. PP	0.01uF	100V	
	C10	UU249330	C. EL	3300uF	25V	
*	C16-17	UU23A150	C. EL	15000uF	16V	
	C18	UR239330	C. EL	3300uF	16V	
*	C19	UU23A150	C. EL	15000uF	16V	
	C20	UR268100	C. EL	100uF	50V	
	C21-22	UR267100	C. EL	10uF	50V	
	C23	UR258470	C. EL	470uF	35V	
	C24	UR249680	C. EL	6800uF	25V	
	C25	UR249330	C. EL	3300uF	25V	
	C26-29	UR267100	C. EL	10uF	50V	
	C30-32	US035100	C. CE. CHP	0.1uF	16V B	
	C33	US035100	C. CE. CHP	0.1uF	16V B	
	C34-35	UR267470	C. EL	47uF	50V	
	C36	UR238100	C. EL	100uF	16V	
	C37-38	UR238100	C. EL	100uF	16V	
	C39	UR238100	C. EL	100uF	16V	
	C40	WE102900	C. PP	0.01uF	100V	
	C41-45	V9415100	C. EL	10uF	16V	
	C46	WE100400	C. PP	47pF	630V	
	C47	WE100900	C. PP	220pF	630V	
	C48	UR267100	C. EL	10uF	50V	

* New Parts

P.C.B. POWER

	Ref. No.	Part No.	Description			Markets
	C49	WE100400	C.PP	47pF	630V	
	C50	WE100900	C.PP	220pF	630V	
	C51	UR267100	C.EL	10uF	50V	
	C52	WE100400	C.PP	47pF	630V	
	C53	WE100900	C.PP	220pF	630V	
	C54	UR267100	C.EL	10uF	50V	
	C55	WE100400	C.PP	47pF	630V	
	C56	WE100900	C.PP	220pF	630V	
	C57	UR267100	C.EL	10uF	50V	
	C58	WE100400	C.PP	47pF	630V	
*	C59	WE100900	C.PP	220pF	630V	
	C60	UR267100	C.EL	10uF	50V	
	C61-62	UU268100	C.EL	100uF	50V	
	C63-64	UR267470	C.EL	47uF	50V	
	C65	UU268100	C.EL	100uF	50V	
	C66-69	WE100100	C.PP	15pF	630V	
	C70	WE100100	C.PP	15pF	630V	
	C71-75	WE101700	C.PP	1000pF	100V	
	C76	UR266470	C.EL	4.7uF	50V	
	C77	UR267470	C.EL	47uF	50V	
	C78	UR218220	C.EL	220uF	6.3V	
	C79	UR237100	C.EL	10uF	16V	
	C80	UR237100	C.EL	10uF	16V	
	C81	WE100400	C.PP	47pF	630V	
	C82	UA652220	C.MYLAR	220pF	50V J	
	C83	UR267100	C.EL	10uF	50V	
	C84	WE100400	C.PP	47pF	630V	
	C85	UA652220	C.MYLAR	220pF	50V J	
	C86	UR267100	C.EL	10uF	50V	
	C87-88	UR297220	C.EL	22uF	100V	
	C89	UR267470	C.EL	47uF	50V	
	C90	UR267470	C.EL	47uF	50V	
	C91-92	UA653100	C.MYLAR	1000pF	50V J	
	C93-94	WE100100	C.PP	15pF	630V	
	C95	WE100900	C.PP	220pF	630V	
	C96	UU238100	C.EL	100uF	16V	
	C98	UR267470	C.EL	47uF	50V	
	C99	UR297220	C.EL	22uF	100V	
	C100	UR297220	C.EL	22uF	100V	
	C101	UR267470	C.EL	47uF	50V	
	C102	US035100	C.CE.CHP	0.1uF	16V B	
	C103	US035100	C.CE.CHP	0.1uF	16V B	
*	C104-106	UU23A150	C.EL	15000uF	16V	
	C107	UR247100	C.EL	10uF	25V	
	C108	UR218470	C.EL	470uF	6.3V	
	C111	US035100	C.CE.CHP	0.1uF	16V B	
	C112-114	US065100	C.CE.CHP	0.1uF	50V B	
	C210	UR297470	C.EL	47uF	100V	

* New Parts

P.C.B. POWER

	Ref. No.	Part No.	Description			Markets
	C369-371	US035100	C.CE.CHP	0.1uF	16V B	
	C372	UR267470	C.EL	47uF	50V	
	C495	UR267470	C.EL	47uF	50V	
	C499	UU266220	C.EL	2.2uF	50V	
	C500	UR267470	C.EL	47uF	50V	
	C501	UU266100	C.EL	1uF	50V	
	D1	VD631600	DIODE	1SS133,176		
	D2	VD631600	DIODE	1SS133,176		
	D3	VD631600	DIODE	1SS133,176		
	D4	VD631600	DIODE	1SS133,176		
*	D5	WA631200	DIODE.ZENR	HZS3B1TD 3.0V TP		
	D6	VG438300	DIODE.ZENR	MTZJ6.8B 6.8V		
	D7	VG439500	DIODE.ZENR	MTZJ10B 10V		
	D8	VD631600	DIODE	1SS133,176		
	D9	VG438700	DIODE.ZENR	MTZJ7.5C 7.5V		
⚠	D10	V4756800	DIODE	S1NB60 1.0A 600V		
⚠	D11	VR253700	DIODE.BRG	S1NB20 1A 200V		
⚠	D12-14	V6855600	DIODE.BRG	D4SBS4-4101 4A		
⚠	D15	V4269600	DIODE.BRG	D2SBA20 1.5A 200V		
	D16	VG440400	DIODE.ZENR	MTZJ13A 13V		
	D19	VU993400	DIODE.ZENR	MA8062-M 6.2V		
	D20	VS997800	DIODE	1T2		
	D21	VS858600	DIODE.ZENR	HZS24-1 24V		
	D22-23	VU996600	DIODE.ZENR	MA8130-M 13.0V		
	D24	VU991700	DIODE.ZENR	MA8043-L 4.1V		
	D28	V2376600	DIODE.SHOT	RB500V-40		
	D30	VT332900	DIODE	1SS355		
	D31	VT332900	DIODE	1SS355		
	D40-42	VD631600	DIODE	1SS133,176		
	D43-45	WA180300	DIODE	1SS244		
	D46	VG437200	DIODE.ZENR	MTZJ4.7C 4.7V		
	D47-49	WA180300	DIODE	1SS244		
	D50-54	WA180300	DIODE	1SS244		
	D56	VG437400	DIODE.ZENR	MTZJ5.1B 5.1V		
	D323	VT332900	DIODE	1SS355		
⚠	F1	KB001390	FUSE	10A 250V		
⚠	F2	VS823400	FUSE	10A 125V		
⚠	IC1-2	V8100500	PHOT.CPL	TLP421 GR		
⚠	IC3	iG001180	IC	TC4013BP FF		
⚠	IC4	XU814A00	IC	PQ05RD11 +5V 1.0A		
⚠	IC5-6	X2530A00	IC	PQ05RD21 +5V 2.0A		
⚠	IC7	XU814A00	IC	PQ05RD11 +5V 1.0A		
* ⚠	IC317-318	X7218A00	IC	PQ30RV21		
⚠	IC319	X2530A00	IC	PQ05RD21 +5V 2.0A		
	IC320	XE436A00	IC	NJM79M05FA		
	PN1	V9637500	PIN	L=70 #18		
	PN40	V9637500	PIN	L=70 #18		
	PN42-47	V9637500	PIN	L=70 #18		

* New Parts

P.C.B. POWER

	Ref. No.	Part No.	Description		Markets
	PN303	V9637500	PIN	L=70 #18	
	Q1	VV912300	TR. DGT	DTC144ESA-TP	
	Q2	iC181510	TR	2SC1815 Y	
	Q3	iC181510	TR	2SC1815 Y	
	Q4	iC181510	TR	2SC1815 Y	
	Q5	iC181510	TR	2SC1815 Y	
⚠	Q6	WC741200	FET	2SK3850	
	Q7	iE102620	FET	2SK246 Y	
* ⚠	Q8	WF691400	TR	2SD2014	
*	Q9	VR043100	FET	2SK208 Y	
*	Q10-12	VR043100	FET	2SK208 Y	
* ⚠	Q13-14	WF691400	TR	2SD2014	
* ⚠	Q15	WF691300	TR	2SB1257	
* ⚠	Q16	WF691400	TR	2SD2014	
	Q17	VV556500	TR	2SA1037K Q,R,S	
	Q18	VV556500	TR	2SA1037K Q,R,S	
	Q20	iC181510	TR	2SC1815 Y	
⚠	Q21	VC141900	TR	2SB941 P,Q	
	Q40-49	iC224030	TR	2SC2240 GR,BL	
	Q50-54	V3966800	TR	2SA949 O,Y	
	Q55	iA097030	TR	2SA970 GR,BL	
	Q56-58	iC224030	TR	2SC2240 GR,BL	
	Q59	iA097030	TR	2SA970 GR,BL	
	Q60-61	iC224030	TR	2SC2240 GR,BL	
⚠	Q62	VC938500	TR	2SC3852	
⚠	Q63	VC614000	TR	2SB1274 Q,R,S	
	Q64-65	V3966800	TR	2SA949 O,Y	
	Q66	iA097030	TR	2SA970 GR,BL	
	Q67-68	iC224030	TR	2SC2240 GR,BL	
	Q319	VV655000	TR. DGT	DTA114EKA	
	Q320	VV556400	TR	2SC2412K Q,R,S	
⚠	Q321	VP872700	TR	2SC4488 S,T	
	Q323	VV655300	TR. DGT	DTA144EKA	
	R9	V6730000	R. CAR.	2.2MΩ 1/2W	
	R13	VU224000	R. MTL. FLM	0.22Ω 1W	
⚠	R20	HV754100	R. CAR. FP	10Ω 1/4W	
	R23	HV756330	R. CAR. FP	3.3KΩ 1/4W	
	R24	HV756470	R. CAR. FP	4.7KΩ 1/4W	
	R25	HV755100	R. CAR. FP	100Ω 1/4W	
	R26	VP939800	R. MTL. OXD	10Ω 1W	
	R31	HV753470	R. CAR. FP	4.7Ω 1/4W	
	R32	HV755100	R. CAR. FP	100Ω 1/4W	
⚠	R39	HV753470	R. CAR. FP	4.7Ω 1/4W	
	R40	HF353220	R. CAR	2.2Ω 1/2W	
	R41-42	HF358100	R. CAR	100KΩ 1/2W	
	R45	HF358100	R. CAR	100KΩ 1/2W	
	R51-52	HF355220	R. CAR	220Ω 1/2W	
	R55	HF355220	R. CAR	220Ω 1/2W	

* New Parts

P.C.B. POWER & P.C.B. INPUT

	Ref. No.	Part No.	Description		Markets
	R61	HF357330	R. CAR	33KΩ 1/2W	
	R62-63	HF356220	R. CAR	2.2KΩ 1/2W	
	R67	HF356220	R. CAR	2.2KΩ 1/2W	
	R68	HF357330	R. CAR	33KΩ 1/2W	
	R70	HF357330	R. CAR	33KΩ 1/2W	
	R76-77	HF356120	R. CAR	1.2KΩ 1/2W	
	R80	HF356120	R. CAR	1.2KΩ 1/2W	
	R81-82	HF357330	R. CAR	33KΩ 1/2W	
	R85	HF357330	R. CAR	33KΩ 1/2W	
	R86-87	HF355330	R. CAR	330Ω 1/2W	
	R90	HF355330	R. CAR	330Ω 1/2W	
	R91	V3733100	R. MTL. OXD	39Ω 1W	
	R92	HF355470	R. CAR	470Ω 1/2W	
	R93	V3733100	R. MTL. OXD	39Ω 1W	
	R94	HF355470	R. CAR	470Ω 1/2W	
	R95-96	HV754390	R. CAR. FP	39Ω 1/4W	
	R97	V3733100	R. MTL. OXD	39Ω 1W	
	R98	HF355470	R. CAR	470Ω 1/2W	
	R101-102	HF357470	R. CAR	47KΩ 1/2W	
	R105	HF357470	R. CAR	47KΩ 1/2W	
	R138	HF353220	R. CAR	2.2Ω 1/2W	
	R145-146	HV754390	R. CAR. FP	39Ω 1/4W	
	R153	HV756470	R. CAR. FP	4.7KΩ 1/4W	
	R154	HV756680	R. CAR. FP	6.8KΩ 1/4W	
	R155	HV756820	R. CAR. FP	8.2KΩ 1/4W	
⚠	R160-162	HV753470	R. CAR. FP	4.7Ω 1/4W	
	R164	HV757100	R. CAR. FP	10KΩ 1/4W	
⚠	R166	HV754100	R. CAR. FP	10Ω 1/4W	
⚠	R168	HV754100	R. CAR. FP	10Ω 1/4W	
⚠	R170-173	HV755100	R. CAR. FP	100Ω 1/4W	
⚠	R499	VP939500	R. MTL. FLM	1Ω 1W	
⚠	R500-501	VP939500	R. MTL. FLM	1Ω 1W	
⚠	RY1	V9366900	RELAY	DLS9D1-O(M)0.25W	
	ST301	WA246200	SCR. TERM	3.5	
* ⚠	T1	X7033A00	TRANS. PWR		
⚠	TE1	VU543100	OUTLET. AC	2P	
⚠	TE2	WB782600	AC INLET	R-30190(26)	
* ⚠	TH1	VV458400	POLY SW	RUEF600 6.00A 30V	
		VT669300	SCR. BW. HD	3x8-8 MFC2	
*		WG082700	P.C.B.	INPUT	
*	CB301	VU443800	CN	JE 15P SE	
	CB302	V7828200	SOCKET	15P TE TUC SERIES	
	CB303-304	V8875300	CN	JE 13P SE	
	CB305	V7826500	CN	15P TE TUC SERIES	
*	CB306	V8809800	CN	JE 9P SE	
	CB307	VB858400	CN. BS. PIN	5P	

* New Parts

P.C.B. INPUT

Ref. No.	Part No.	Description			Markets
CB308	V7826500	CN	15P TE TUC SERIES		
CB309	V7828200	SOCKET	15P TE TUC SERIES		
CB315-316	V7827000	CN	20P TE TUC SERIES		
CB317	V7825600	CN	6P TE TUC SERIES		
CB332	VB390800	CN.BS.PIN	12P		
CB600	VP798200	CN.BS.PIN	24P		
CB601	VC166500	CN.BS.PIN	12P		
CB909	VF982300	CN.BS.PIN	17P		
CB910	VQ047200	CN.BS.PIN	9P		
C301-302	US135100	C.CE.CHP	0.1uF	16V	
C303-306	US062220	C.CE.CHP	220pF	50V B	
C307-308	US062100	C.CE.CHP	100pF	50V B	
C309-310	US062220	C.CE.CHP	220pF	50V B	
C311-312	US062100	C.CE.CHP	100pF	50V B	
C313-314	UA652220	C.MYLAR	220pF	50V J	
C315-316	US062220	C.CE.CHP	220pF	50V B	
C317-320	UA652220	C.MYLAR	220pF	50V J	
C321	UA652470	C.MYLAR	470pF	50V J	
C322	UA652220	C.MYLAR	220pF	50V J	
C323-328	UR266220	C.EL	2.2uF	50V	
C329-330	UR218220	C.EL	220uF	6.3V	
C331-332	UA654390	C.MYLAR	0.039uF	50V J	
C333-334	UA654110	C.MYLAR	0.011uF	50V J	
C335-342	UR237100	C.EL	10uF	16V	
C343-344	UR237470	C.EL	47uF	16V	
C345-348	UA653100	C.MYLAR	1000pF	50V J	
C349-350	UR267470	C.EL	47uF	50V	
C351-354	UR237100	C.EL	10uF	16V	
C355-356	UR267470	C.EL	47uF	50V	
C357-358	UR266470	C.EL	4.7uF	50V	
C359-360	UT952100	C.PP	100pF	100V	
C361-362	UR267470	C.EL	47uF	50V	
C363	US135100	C.CE.CHP	0.1uF	16V	
C364-365	UR266470	C.EL	4.7uF	50V	
C366	US135100	C.CE.CHP	0.1uF	16V	
C367-368	UR237100	C.EL	10uF	16V	
C373-376	US062470	C.CE.CHP	470pF	50V B	
C377-380	US062220	C.CE.CHP	220pF	50V B	
C381-382	US062100	C.CE.CHP	100pF	50V B	
C383-384	US062220	C.CE.CHP	220pF	50V B	
C385-386	US062100	C.CE.CHP	100pF	50V B	
C387-388	UA652220	C.MYLAR	220pF	50V J	
C389-390	US062220	C.CE.CHP	220pF	50V B	
C391-394	UR266470	C.EL	4.7uF	50V	
C395	UR237100	C.EL	10uF	16V	
C396	US135100	C.CE.CHP	0.1uF	16V	
C397	UR237100	C.EL	10uF	16V	
C398-399	UR237470	C.EL	47uF	16V	

* New Parts

P.C.B. INPUT

Ref. No.	Part No.	Description			Markets
C400-401	UR237220	C.EL	22uF	16V	
C403	UR237470	C.EL	47uF	16V	
C404	US135100	C.CE.CHP	0.1uF	16V	
C405-406	US034680	C.CE.CHP	0.068uF	16V K	
C407-414	VR168300	C.MYLAR	0.1uF	50V	
C415-418	UA653270	C.MYLAR	2700pF	50V J	
C419	US135100	C.CE.CHP	0.1uF	16V	
C420-421	UR267470	C.EL	47uF	50V	
C422-425	UR266470	C.EL	4.7uF	50V	
C426-429	US135100	C.CE.CHP	0.1uF	16V	
C430	UR237470	C.EL	47uF	16V	
C431	US135100	C.CE.CHP	0.1uF	16V	
C432-434	UR237100	C.EL	10uF	16V	
C435	UR237470	C.EL	47uF	16V	
C436	UR237100	C.EL	10uF	16V	
C437	US135100	C.CE.CHP	0.1uF	16V	
C438-439	UR237100	C.EL	10uF	16V	
C442	US063100	C.CE.CHP	1000pF	50V B	
C443-444	US135100	C.CE.CHP	0.1uF	16V	
C447	US063100	C.CE.CHP	1000pF	50V B	
C448-451	UA652470	C.MYLAR	470pF	50V J	
C452	VE326800	C.MYLAR	0.47uF	50V	
C453-455	UA652470	C.MYLAR	470pF	50V J	
C456	US063100	C.CE.CHP	1000pF	50V B	
C461	UR218100	C.EL	100uF	6.3V	
C600-602	US064100	C.CE.CHP	0.01uF	50V B	
C603	US135100	C.CE.CHP	0.1uF	16V	
C604	UR218100	C.EL	100uF	6.3V	
C605	US064100	C.CE.CHP	0.01uF	50V B	
C606	UR218330	C.EL	330uF	6.3V	
C607	US135100	C.CE.CHP	0.1uF	16V	
C608-609	US062100	C.CE.CHP	100pF	50V B	
C610	US135100	C.CE.CHP	0.1uF	16V	
C611	UR218330	C.EL	330uF	6.3V	
C612	US135100	C.CE.CHP	0.1uF	16V	
C614	US062100	C.CE.CHP	100pF	50V B	
C619	US064100	C.CE.CHP	0.01uF	50V B	
C622	US064100	C.CE.CHP	0.01uF	50V B	
C623-624	US135100	C.CE.CHP	0.1uF	16V	
C625-631	US061220	C.CE.CHP	22pF	50V B	
C632	US135100	C.CE.CHP	0.1uF	16V	
C633-634	US063100	C.CE.CHP	1000pF	50V B	
C635	UR267470	C.EL	47uF	50V	
D301-302	VT332900	DIODE	1SS355		
D305	VT332900	DIODE	1SS355		
D307-308	VT332900	DIODE	1SS355		
D309	V2598200	LED	SIR-505ST		
D311-312	VT332900	DIODE	1SS355		

* New Parts

P.C.B. INPUT & A-VIDEO

	Ref. No.	Part No.	Description		Markets
	D313-314	VU992100	DIODE.ZENR	MA8047-L 4.6V	
*	D600-601	VU171600	DIODE.ZENR	UDZS3.9BTE-17 3.9V	
	IC301	X5045A00	IC	NJU7312AM	
	IC302	X5043A00	IC	NJU7313AM	
	IC303	X3547A00	IC	BD3841FS	
	IC304-308	X3505A00	IC	NJM2068MD-TE2	
	IC309	X3547A00	IC	BD3841FS	
*	IC310-311	X5574A00	IC	YAC526-EZE2	
*	IC312-313	X6878A00	IC	LC75348M	
	IC600-601	X6386A00	IC	M66003-0131FP	
*	JK301	WD195900	JACK.MNI	2P	
*	JK302-303	V9435700	JACK.MNI	MSJ-035-12APC	
	PJ301-302	VV306900	JACK.PIN	4P	
	PJ303	V5478700	JACK.PIN	4P RJ-1073F-09	
*	PJ304	V5478900	JACK.PIN	RJ-1074-84-0353A	
	PJ305-307	VV325400	JACK.PIN	6P	
	PJ308	VV306900	JACK.PIN	4P	
	PJ309	V5479100	JACK.PIN	4P RJ-1073-39-0351	
	PN301	V9637500	PIN	L=70 #18	
	PN600-601	V9637500	PIN	L=70 #18	
	Q301-308	VZ725900	TR	2SD1938F S,T	
	Q309	VP872600	TR	2SA1708 S,T	
	Q310	VV655700	TR.DGT	DTC144EKA	
	Q311	VP872600	TR	2SA1708 S,T	
	Q312	VV655700	TR.DGT	DTC144EKA	
	Q600-608	VV556400	TR	2SC2412K Q,R,S	
	R365-366	HV755100	R.CAR.FP	100Ω 1/4W	
	R375-376	VP939700	R.MTL.FLM	4.7Ω 1W	
	R387-390	HF355470	R.CAR	470Ω 1/2W	
	R444	VP939700	R.MTL.FLM	4.7Ω 1W	
	R450	VP939700	R.MTL.FLM	4.7Ω 1W	
	R467-474	HF354470	R.CAR	47Ω 1/2W	
	R477-478	HF354270	R.CAR	27Ω 1/2W J	
	R600-601	HL005100	R.MTL.OXD	100Ω 1/2W	
	ST301-302	V4040500	SCR.TERM	M3	
	SW600	V4757100	SW.TACT	EVQ11A	
	SW601	V9281300	SW.RT.ENC	EVEKD2F3024B	
	U301	V8210200	L.DTCT	GP1UD271XK	
	U600	V8210200	L.DTCT	GP1UD271XK	
*	V600	WF875800	FL.DSPLY	HNA-16ML10T	
		V6007000	SHEET		
		V3747400	SPACER.FL	6x18 t=4	
*		WF649700	SUPRT		
*		WG081000	P.C.B.	A-VIDEO	
	CB601	V7827800	SOCKET	11P SE TUC SERIES	

* New Parts

P.C.B. A-VIDEO

Ref. No.	Part No.	Description		Markets
CB602	VQ047800	CN.BS.PIN	27P	
CB603	V7828700	SOCKET	20P SE TUC SERIES	
CB701	V7828100	SOCKET	14P TE TUC SERIES	
CB703	VQ045600	CN.BS.PIN	27P SE	
CB704	V7827300	SOCKET	6P TE TUC SERIES	
C611-613	US060800	C.CE.CHP	8pF 50V B	
C641	US135100	C.CE.CHP	0.1uF 16V	
C642	UR237470	C.EL	47uF 16V	
C643	US135100	C.CE.CHP	0.1uF 16V	
C644	UR237470	C.EL	47uF 16V	
C645	US135100	C.CE.CHP	0.1uF 16V	
C646	UR237470	C.EL	47uF 16V	
C647	US135100	C.CE.CHP	0.1uF 16V	
C648	UR237470	C.EL	47uF 16V	
C649	US135100	C.CE.CHP	0.1uF 16V	
C650	UR237470	C.EL	47uF 16V	
C651	US135100	C.CE.CHP	0.1uF 16V	
C652	UR237470	C.EL	47uF 16V	
C653	US135100	C.CE.CHP	0.1uF 16V	
C654	UR237470	C.EL	47uF 16V	
C655	US135100	C.CE.CHP	0.1uF 16V	
C656	UR237470	C.EL	47uF 16V	
C657	US135100	C.CE.CHP	0.1uF 16V	
C658	UR237470	C.EL	47uF 16V	
C659	US135100	C.CE.CHP	0.1uF 16V	
C660	UR237470	C.EL	47uF 16V	
C661	US135100	C.CE.CHP	0.1uF 16V	
C662-663	UR237470	C.EL	47uF 16V	
C664-665	US135100	C.CE.CHP	0.1uF 16V	
C666-667	UR237470	C.EL	47uF 16V	
C668-669	US135100	C.CE.CHP	0.1uF 16V	
C670	UR237470	C.EL	47uF 16V	
C672-673	US135100	C.CE.CHP	0.1uF 16V	
C674	UR237470	C.EL	47uF 16V	
C676	US135100	C.CE.CHP	0.1uF 16V	
C677	UR218330	C.EL	330uF 6.3V	
C678	US135100	C.CE.CHP	0.1uF 16V	
* C679	UR238330	C.EL	330uF 16V	
C680	US135100	C.CE.CHP	0.1uF 16V	
C681	UR218330	C.EL	330uF 6.3V	
C682	US135100	C.CE.CHP	0.1uF 16V	
C683	UR266100	C.EL	1uF 50V	
C686	US135100	C.CE.CHP	0.1uF 16V	
C687-691	UR266100	C.EL	1uF 50V	
C692	US135100	C.CE.CHP	0.1uF 16V	
C693	UR238470	C.EL	470uF 16V	
C694	US135100	C.CE.CHP	0.1uF 16V	
C695	US064100	C.CE.CHP	0.01uF 50V B	

* New Parts

P.C.B. A-VIDEO

Ref. No.	Part No.	Description			Markets
C696	UR266220	C.EL	2.2uF	50V	
C697	US135100	C.CE.CHP	0.1uF	16V	
C698	UR238100	C.EL	100uF	16V	
C699	US135100	C.CE.CHP	0.1uF	16V	
C701-702	US135100	C.CE.CHP	0.1uF	16V	
C703	US135100	C.CE.CHP	0.1uF	16V	*
C704-705	US135100	C.CE.CHP	0.1uF	16V	
C706-708	US061470	C.CE.CHP	47pF	50V B	
C709	US135100	C.CE.CHP	0.1uF	16V	*
C710-712	US061470	C.CE.CHP	47pF	50V B	
C713	US135100	C.CE.CHP	0.1uF	16V	
C714-716	US062100	C.CE.CHP	100pF	50V B	
C718	US135100	C.CE.CHP	0.1uF	16V	
C742-743	UR237470	C.EL	47uF	16V	
C745-746	UR237470	C.EL	47uF	16V	*
C748-749	UR237470	C.EL	47uF	16V	
C752-754	US135100	C.CE.CHP	0.1uF	16V	
C755	UR218220	C.EL	220uF	6.3V	
C757	UR218220	C.EL	220uF	6.3V	*
C759-760	UR218100	C.EL	100uF	6.3V	
C761-762	US135100	C.CE.CHP	0.1uF	16V	
C763	UR218220	C.EL	220uF	6.3V	*
C764-765	US135100	C.CE.CHP	0.1uF	16V	*
C766	UR218220	C.EL	220uF	6.3V	*
C771-772	UR266470	C.EL	4.7uF	50V	
C774-775	US135100	C.CE.CHP	0.1uF	16V	*
C776	UR237100	C.EL	10uF	16V	
C777	UR266470	C.EL	4.7uF	50V	*
C778	UR218100	C.EL	100uF	6.3V	
C779	UR218330	C.EL	330uF	6.3V	*
C780	UR218100	C.EL	100uF	6.3V	
C781-782	US060300	C.CE.CHP	3pF	50V B	
C783-784	US061240	C.CE.CHP	24pF	50V B	*
C785	US060300	C.CE.CHP	3pF	50V B	
C786	US135100	C.CE.CHP	0.1uF	16V	
C787	UR218100	C.EL	100uF	6.3V	
C788-789	UR266100	C.EL	1uF	50V	
C791	US063120	C.CE.CHP	1200pF	50V B	
C792	US062470	C.CE.CHP	470pF	50V B	
C799	US135100	C.CE.CHP	0.1uF	16V	
C811	US064100	C.CE.CHP	0.01uF	50V B	
C812	UR218470	C.EL	470uF	6.3V	
C813	US062120	C.CE.CHP	120pF	50V B	
C814	US062220	C.CE.CHP	220pF	50V B	
C815	UR237100	C.EL	10uF	16V	
C816	UR237470	C.EL	47uF	16V	
C821-822	US135100	C.CE.CHP	0.1uF	16V	
C824	US062220	C.CE.CHP	220pF	50V B	

* New Parts

P.C.B. A-VIDEO

Ref. No.	Part No.	Description			Markets
C826	US062220	C.CE.CHP	220pF	50V B	
D611-612	VT332900	DIODE	1SS355		
D701-706	VT332900	DIODE	1SS355		
D771-774	VT332900	DIODE	1SS355		
D811-812	VT332900	DIODE	1SS355		
IC601	X6757A00	IC	NJW1321FP1		
IC602	X2904A00	IC	NJM2581M VIDEO AMP		
IC605	X2484A00	IC	TA1318AF		
IC606	X6758A00	IC	LA73054-TLM-E		
IC607	XY877A00	IC	MM74HC4053SJX		
IC701	XY550A00	IC	MM74HC4051SJX		
IC703	XY550A00	IC	MM74HC4051SJX		
IC705	X4321A00	IC	CD4051BNSR		
IC708	XY877A00	IC	MM74HC4053SJX		
IC709	X6742A00	IC	LA73050-TLM-E		
IC710	XZ177A00	IC	LA7104M VIDEO AMP		
IC712	XW939A00	IC	TK15420M VIDEO AMP		
IC713	XD598A00	IC	TC74HCU04AFEL INV		
IC714	X6849A00	IC	BD7851FP-E2		
IC715	X5597A00	IC	LC74781JM-9798		
IC716	XY877A00	IC	MM74HC4053SJX		
JK701-702	WD396300	JACK.PIN	LAP5100-1601FC		
JK703	WD396100	JACK.PIN	LAP5100-1801FC		
PJ601-602	WD442700	JACK.PIN	LPR6520-M610FC		
PN701-702	V9637500	PIN	L=70 #18		
Q601-602	WG261200	FET	2SK2158-T2B-A		
Q701	VV556400	TR	2SC2412K Q,R,S		
Q702	WF550000	TR	2SC3837K T146 N,P		
Q703	VV556500	TR	2SA1037K Q,R,S		
Q704	WF549900	TR	2SC3906K T146 R,S		
Q705	VZ725900	TR	2SD1938F S,T		
Q706	VV556400	TR	2SC2412K Q,R,S		
Q711-713	WG261200	FET	2SK2158-T2B-A		
Q717	VV556400	TR	2SC2412K Q,R,S		
R665	HV753100	R.CAR.FP	1Ω	1/4W	
R676-677	HV753100	R.CAR.FP	1Ω	1/4W	
R680	HV753100	R.CAR.FP	1Ω	1/4W	
R688-690	HV753100	R.CAR.FP	1Ω	1/4W	
R738-739	HV753100	R.CAR.FP	1Ω	1/4W	
R760-763	HV753100	R.CAR.FP	1Ω	1/4W	
R780	HV755470	R.CAR.FP	470Ω	1/4W	
R783	HV753220	R.CAR.FP	2.2Ω	1/4W	
R787	HV755470	R.CAR.FP	470Ω	1/4W	
R790-791	HV755470	R.CAR.FP	470Ω	1/4W	
R794-795	HV753100	R.CAR.FP	1Ω	1/4W	
R800	HV755470	R.CAR.FP	470Ω	1/4W	
R812	HV753220	R.CAR.FP	2.2Ω	1/4W	
R821	HV753100	R.CAR.FP	1Ω	1/4W	

* New Parts

P.C.B. A-VIDEO & P.C.B. D-VIDEO

	Ref. No.	Part No.	Description		Markets
	XL601	V5345200	RSNR.CE	CSBLA503KECZF30-B0	
	XL715	WC061400	RSNR.CRYS	14.31818MHz SMD-49	
*		WG081900	P.C.B.	D-VIDEO	
	CB302	V9356900	CN	JE 19P SE	
	CB501	V7828700	SOCKET	20P SE TUC SERIES	
	CB502	V8875300	CN	JE 13P SE	
	CB504	VQ044400	CN.BS.PIN	9P	
	CB506	LB919020	CN.BS.PIN	2P	
	CB507	V6509500	SOCKET	9P SE 3170	
	CB508	LB919040	CN.BS.PIN	4P	
	CB510	V9356900	CN	JE 19P SE	
*	CN301-303	WC688700	CN	19P HDMI	
	C301-302	US135100	C.CE.CHP	0.1uF 16V	
	C303	V5333500	C.CE.CHP	10uF 6.3V	
	C304-305	US063100	C.CE.CHP	1000pF 50V B	
	C306-309	US135100	C.CE.CHP	0.1uF 16V	
	C310-311	US063100	C.CE.CHP	1000pF 50V B	
	C312	US135100	C.CE.CHP	0.1uF 16V	
	C313	US063100	C.CE.CHP	1000pF 50V B	
	C314-316	US135100	C.CE.CHP	0.1uF 16V	
	C317	US063100	C.CE.CHP	1000pF 50V B	
	C318-319	US135100	C.CE.CHP	0.1uF 16V	
	C320	US063100	C.CE.CHP	1000pF 50V B	
	C321-322	US064100	C.CE.CHP	0.01uF 50V B	
	C323-325	V5333500	C.CE.CHP	10uF 6.3V	
	C326	US135100	C.CE.CHP	0.1uF 16V	
	C327-329	V5333500	C.CE.CHP	10uF 6.3V	
	C330-344	US135100	C.CE.CHP	0.1uF 16V	
	C345	US061150	C.CE.CHP	15pF 50V B	
	C346	US064100	C.CE.CHP	0.01uF 50V B	
	C350	US135100	C.CE.CHP	0.1uF 16V	
	C351	US064100	C.CE.CHP	0.01uF 50V B	
	C352	US061150	C.CE.CHP	15pF 50V B	
	C353-363	US135100	C.CE.CHP	0.1uF 16V	
	C364	UF018100	C.EL.CHP	100uF 6.3V	
	C365-366	US135100	C.CE.CHP	0.1uF 16V	
	C367	UF018100	C.EL.CHP	100uF 6.3V	
	C368	US135100	C.CE.CHP	0.1uF 16V	
	C381-383	US135100	C.CE.CHP	0.1uF 16V	
	C384-387	US063100	C.CE.CHP	1000pF 50V B	
	C388-389	US135100	C.CE.CHP	0.1uF 16V	
	C390-392	US063100	C.CE.CHP	1000pF 50V B	
	C509	US135100	C.CE.CHP	0.1uF 16V	
	C510	US064100	C.CE.CHP	0.01uF 50V B	
	C511	UF037100	C.EL.CHP	10uF 16V	

* New Parts

P.C.B. D-VIDEO

	Ref. No.	Part No.	Description		Markets
	C512-513	US135100	C.CE.CHP	0.1uF 16V	
	C514-515	UF037100	C.EL.CHP	10uF 16V	
	C517-520	US135100	C.CE.CHP	0.1uF 16V	
	C521-522	US064100	C.CE.CHP	0.01uF 50V B	
	C524	UF037100	C.EL.CHP	10uF 16V	
	C525-531	US135100	C.CE.CHP	0.1uF 16V	
	C532	US064100	C.CE.CHP	0.01uF 50V B	
	C533	US063100	C.CE.CHP	1000pF 50V B	
	C534	US064100	C.CE.CHP	0.01uF 50V B	
*	C536	US034820	C.CE.CHP	0.082uF 16V K	
	C538	US064100	C.CE.CHP	0.01uF 50V B	
	C539	US135100	C.CE.CHP	0.1uF 16V	
	C540	US060700	C.CE.CHP	7pF 50V B	
	C541	US064100	C.CE.CHP	0.01uF 50V B	
	C542-543	US135100	C.CE.CHP	0.1uF 16V	
	C544	US060700	C.CE.CHP	7pF 50V B	
	C545	UF018100	C.EL.CHP	100uF 6.3V	
	C546	US135100	C.CE.CHP	0.1uF 16V	
	C548	US135100	C.CE.CHP	0.1uF 16V	
	C549-555	UF018100	C.EL.CHP	100uF 6.3V	
	C558	US064100	C.CE.CHP	0.01uF 50V B	
	C559	US135100	C.CE.CHP	0.1uF 16V	
	C560-561	US064100	C.CE.CHP	0.01uF 50V B	
	C562-563	US135100	C.CE.CHP	0.1uF 16V	
	C564	UF037470	C.EL.CHP	47uF 16V	
	C567	US062820	C.CE.CHP	820pF 50V B	
	C568-569	US135100	C.CE.CHP	0.1uF 16V	
	C570	US063390	C.CE.CHP	3900pF 50V B	
	C571-572	US135100	C.CE.CHP	0.1uF 16V	
	C583-584	UF037100	C.EL.CHP	10uF 16V	
	C587	US135100	C.CE.CHP	0.1uF 16V	
	C598	UF037100	C.EL.CHP	10uF 16V	
	C600	UF037100	C.EL.CHP	10uF 16V	
	C601-602	US135100	C.CE.CHP	0.1uF 16V	
	C603	UF037470	C.EL.CHP	47uF 16V	
	C609	UF037470	C.EL.CHP	47uF 16V	
	C610	US135100	C.CE.CHP	0.1uF 16V	
	C612-620	US135100	C.CE.CHP	0.1uF 16V	
	C621	UF037470	C.EL.CHP	47uF 16V	
	C622-629	US135100	C.CE.CHP	0.1uF 16V	
	C630	UF037470	C.EL.CHP	47uF 16V	
	C631	US135100	C.CE.CHP	0.1uF 16V	
	C633-636	US135100	C.CE.CHP	0.1uF 16V	
	C638-639	US135100	C.CE.CHP	0.1uF 16V	
	C640	UF037470	C.EL.CHP	47uF 16V	
	C641-643	US135100	C.CE.CHP	0.1uF 16V	
	C644	US063100	C.CE.CHP	1000pF 50V B	
	C645	US135100	C.CE.CHP	0.1uF 16V	

* New Parts

P.C.B. D-VIDEO

Ref. No.	Part No.	Description			Markets
C647	US135100	C.CE.CHP	0.1uF	16V	
C651-652	UR238470	C.EL	470uF	16V	
C654-657	US135100	C.CE.CHP	0.1uF	16V	
C660	UF018100	C.EL.CHP	100uF	6.3V	
C663-664	US135100	C.CE.CHP	0.1uF	16V	
C666-667	UR237470	C.EL	47uF	16V	
C669-670	UR238470	C.EL	470uF	16V	
C673	US135100	C.CE.CHP	0.1uF	16V	
C675-676	US135100	C.CE.CHP	0.1uF	16V	
C679-680	US135100	C.CE.CHP	0.1uF	16V	
C684	UF037470	C.EL.CHP	47uF	16V	
C685-686	UR237470	C.EL	47uF	16V	
C689	US064100	C.CE.CHP	0.01uF	50V B	
C690	UF037470	C.EL.CHP	47uF	16V	
C691-693	US135100	C.CE.CHP	0.1uF	16V	
C697-699	US135100	C.CE.CHP	0.1uF	16V	
C700-701	US135100	C.CE.CHP	0.1uF	16V	
C704-705	US135100	C.CE.CHP	0.1uF	16V	
C706-708	US064100	C.CE.CHP	0.01uF	50V B	
C710	US064100	C.CE.CHP	0.01uF	50V B	
C714	US135100	C.CE.CHP	0.1uF	16V	
C726	US135100	C.CE.CHP	0.1uF	16V	
C740	US135100	C.CE.CHP	0.1uF	16V	
C741	US063100	C.CE.CHP	1000pF	50V B	
C742	US135100	C.CE.CHP	0.1uF	16V	
C743	US063100	C.CE.CHP	1000pF	50V B	
C744	US135100	C.CE.CHP	0.1uF	16V	
C745	US063100	C.CE.CHP	1000pF	50V B	
C746	US135100	C.CE.CHP	0.1uF	16V	
C747	US063100	C.CE.CHP	1000pF	50V B	
C748-749	US135100	C.CE.CHP	0.1uF	16V	
C750	US063100	C.CE.CHP	1000pF	50V B	
C751-752	US135100	C.CE.CHP	0.1uF	16V	
C753	US063100	C.CE.CHP	1000pF	50V B	
C754	US135100	C.CE.CHP	0.1uF	16V	
C755	US063100	C.CE.CHP	1000pF	50V B	
C756-757	US135100	C.CE.CHP	0.1uF	16V	
C758	US063100	C.CE.CHP	1000pF	50V B	
C759-762	US135100	C.CE.CHP	0.1uF	16V	
C763	US063100	C.CE.CHP	1000pF	50V B	
C764-767	US135100	C.CE.CHP	0.1uF	16V	
C771	US063100	C.CE.CHP	1000pF	50V B	
C772	US126100	C.CE.CHP	1uF	10V	
C773	US063100	C.CE.CHP	1000pF	50V B	
C774	US126100	C.CE.CHP	1uF	10V	
C775-780	US063100	C.CE.CHP	1000pF	50V B	
C781	US126100	C.CE.CHP	1uF	10V	
C782	US063100	C.CE.CHP	1000pF	50V B	

* New Parts

P.C.B. D-VIDEO

Ref. No.	Part No.	Description			Markets
C783	US126100	C.CE.CHP	1uF	10V	
C784-786	US064100	C.CE.CHP	0.01uF	50V B	
C787	US135100	C.CE.CHP	0.1uF	16V	
C789	US135100	C.CE.CHP	0.1uF	16V	
D312	VT332900	DIODE	1SS355		
D315	VT332900	DIODE	1SS355		
D318	VT332900	DIODE	1SS355		
D321-325	VT332900	DIODE	1SS355		
D601-603	VT332900	DIODE	1SS355		
D605-608	VT332900	DIODE	1SS355		
D610-617	VT332900	DIODE	1SS355		
IC301-302	X4503A00	IC	SN74CBT3306PWR		
IC303-304	X3530A00	IC	24LC04BT-I/SN		
IC305	X4061A00	IC	SN74AHC2GU04HDCTR		
IC306	X5817A00	IC	LE50ABD 5.0V 0.1A		
IC307	X3801A00	IC	SN74LVC1G125DCKR		
IC308	X5816A00	IC.CPU	SII9030CTU HDMI TX		
IC309	X5815A00	IC.CPU	SII9031CTU HDMI RX		
IC310	X5818A00	IC.CPU	PCA9540BDP I2C MUX		
IC311	XZ287A00	IC	SN74LVC245APWR		
IC312	X5827A00	IC	UPC37M31TJ-E1-AZ		
IC314	X4465A00	IC	SN74AHCT1G125DCKR		
IC501	X2965A00	IC.CPU	M30805SGP		
IC503	X6802A00	IC	ADV7401BSTZ-80		*
IC504	X6801A00	IC	ADV7322KSTZ		*
IC505	X6853A00	IC	MATISSE 1A G		*
IC507	X7220A00	IC	S29JL032H70TFI020		*
IC509	X2590B00	IC	W9816G6CH-7 SDRAM		
IC510-512	X5741A00	IC	SN74LVC541APWR		
IC520	X2709A00	IC	SN74AHCT245PWR		
IC521	X4463A00	IC	SN74LV08APWR		
IC522	X3824A00	IC	SN74AHCT08PWR		
IC524	X6848A00	IC	LA73053-TLM-E		*
IC525	X7171A00	IC	SN74LVC2G125DCUR		*
IC526	X4465A00	IC	SN74AHCT1G125DCKR		
IC527	XZ000A00	IC	PST9242NR		
IC528	X4454A00	IC	SN74LVC2G17DCKR		
IC529	X6876A00	IC	ADM222ARZ		*
IC601	X5826A00	IC	UPC2905AT-E1-AZ		
IC602	X6869A00	IC	NJM2885DL1-33		*
IC603	X6870A00	IC	NJM2845DL1-33		*
IC605	X6867A00	IC	NJM2391DL1-25		*
IC606	X6868A00	IC	NJM2885DL1-18		*
IC607-609	X5741A00	IC	SN74LVC541APWR		
PS301	V2997600	IC	SMDC050-02		
Q301-302	VQ986700	TR	2SC4081 T106		
Q309	WE834500	FET	UPA672T-T1-A		
Q310-311	WD760200	FET	2N7002-NL TP		

* New Parts

P.C.B. D-VIDEO

	Ref. No.	Part No.	Description		Markets
	Q501-504	VQ986700	TR	2SC4081 T106	
*	Q505-508	WG261200	FET	2SK2158-T2B-A	
	R630-632	VP939700	R. MTL. FLM	4.7Ω 1W	
	R637	VP939700	R. MTL. FLM	4.7Ω 1W	
	R642	VP939600	R. MTL. FLM	2.2Ω 1W	
	R643	WB784100	R. MTL. FLM	1.2Ω 1W	
	RV309-332	WE674800	DIODE	AVRL161A1R1NTB	
	ST301	V4040500	SCR. TERM	M3	
	XL301	VZ268400	RSNR. CRYS	27MHz SMD-49	
	XL501	V9864200	RSNR. CE	10.0MHz	
*	XL502	VZ772700	RSNR. CRYS	28.63636MHz	

* New Parts

Chip Resistors

- The chip resistor is not supplied as a replacement part.
  * When a chip resistor is necessary, use the following part.
  AAX60720: CHIP RESISTOR SAMPLE BOOK

Ref. No.	Part No.	Description			Markets
		R. CHP	0Ω	1/16W J	
		R. CHP	2.2Ω	1/16W J	
		R. CHP	10Ω	1/16W J	
		R. CHP	47Ω	1/16W J	
		R. CHP	56Ω	1/16W J	
		R. CHP	75Ω	1/16W J	
		R. CHP	82Ω	1/16W J	
		R. CHP	100Ω	1/16W J	
		R. CHP	180Ω	1/16W J	
		R. CHP	220Ω	1/16W J	
		R. CHP	470Ω	1/16W J	
		R. CHP	820Ω	1/16W J	
		R. CHP	1KΩ	1/16W J	
		R. CHP	1.2KΩ	1/16W J	*
		R. CHP	1.3KΩ	1/16W J	
		R. CHP	1.5KΩ	1/16W J	
		R. CHP	1.8KΩ	1/16W J	
		R. CHP	2.2KΩ	1/16W J	
		R. CHP	2.4KΩ	1/16W J	
		R. CHP	2.7KΩ	1/16W J	
		R. CHP	3.3KΩ	1/16W J	
		R. CHP	4.7KΩ	1/16W J	
		R. CHP	5.6KΩ	1/16W J	
		R. CHP	8.2KΩ	1/16W J	
		R. CHP	10KΩ	1/16W J	
		R. CHP	18KΩ	1/16W J	
		R. CHP	22KΩ	1/16W J	
		R. CHP	27KΩ	1/16W J	
		R. CHP	47KΩ	1/16W J	
		R. CHP	56KΩ	1/16W J	
		R. CHP	62KΩ	1/16W J	
		R. CHP	100KΩ	1/16W J	
		R. CHP	220KΩ	1/16W J	
		R. CHP	470KΩ	1/16W J	
		R. CHP	1MΩ	1/16W J	
		R. MTL. CHP	10Ω	1/16W D	
		R. MTL. CHP	33Ω	1/16W D	
		R. MTL. CHP	47Ω	1/16W D	
		R. MTL. CHP	100Ω	1/16W D	
		R. MTL. CHP	120Ω	1/16W D	
		R. MTL. CHP	150Ω	1/16W D	
		R. MTL. CHP	180Ω	1/16W D	
		R. MTL. CHP	330Ω	1/16W D	
		R. MTL. CHP	470Ω	1/16W D	
		R. MTL. CHP	620Ω	1/16W D	

* New Parts

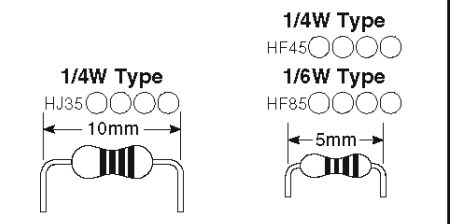
Chip Resistors

Ref. No.	Part No.	Description			Markets
		R. MTL. CHP	2KΩ	1/16W D	
		R. MTL. CHP	2.2KΩ	1/16W D	
		R. MTL. CHP	2.4KΩ	1/16W D	
		R. MTL. CHP	2.7KΩ	1/16W D	
		R. MTL. CHP	3KΩ	1/16W D	
		R. MTL. CHP	3.3KΩ	1/16W D	
		R. MTL. CHP	4.3KΩ	1/16W D	
		R. MTL. CHP	4.7KΩ	1/16W D	
		R. MTL. CHP	5.6KΩ	1/16W D	
		R. MTL. CHP	6.8KΩ	1/16W D	
		R. MTL. CHP	7.5KΩ	1/16W D	
		R. MTL. CHP	11KΩ	1/16W D	
		R. MTL. CHP	12KΩ	1/16W D	
		R. MTL. CHP	15KΩ	1/16W D	
		R. MTL. CHP	47KΩ	1/16W D	
		R. MTL. CHP	82KΩ	1/16W D	
		R. CAR. CHP	180KΩ	1/16W J	

* New Parts

Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 kΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	※	11 kΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 kΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 kΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 kΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 kΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 kΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 kΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 kΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 kΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 kΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 kΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 kΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 kΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 kΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 kΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 kΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 kΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 kΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 kΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 kΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 kΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	※	120 kΩ	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	※
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	※
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			



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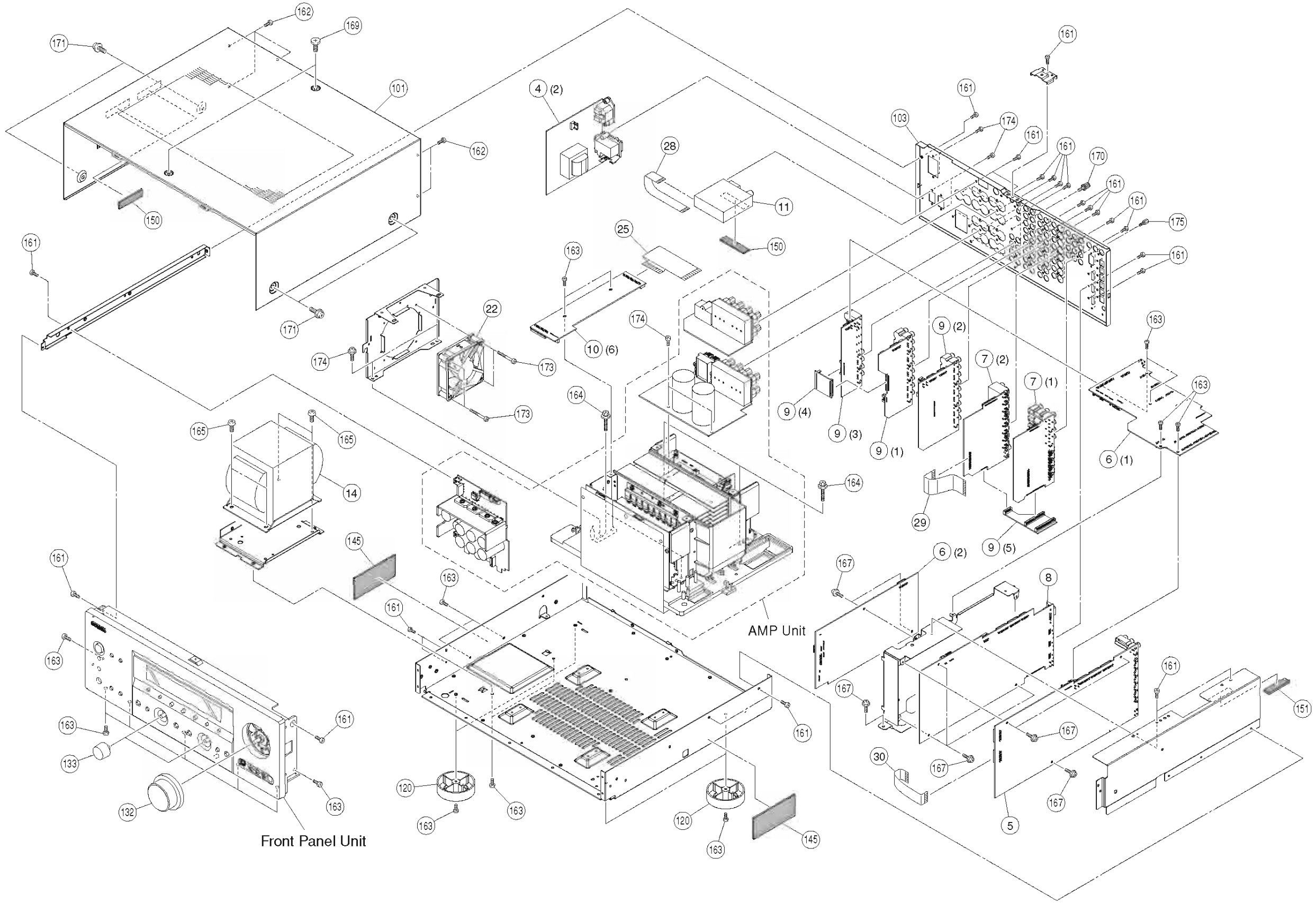
■ EXPLODED VIEW

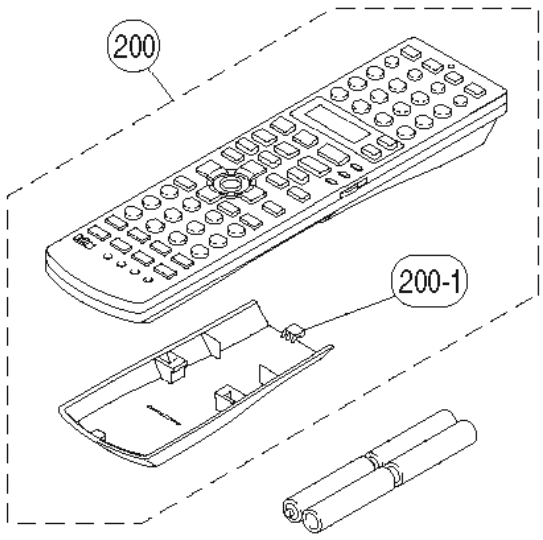


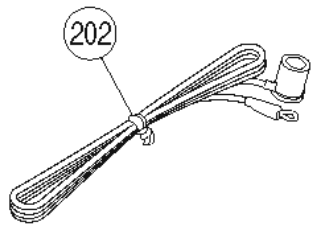
■ MECHANICAL PARTS

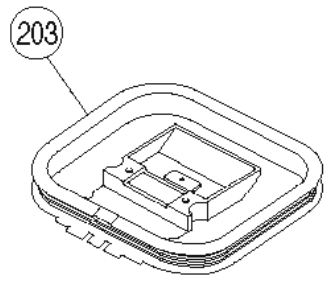
	Ref. No.	Part No.	Description		Remarks	Markets
*	4	WG076400	P.C.B. ASS'Y	POWER		
*	5	WG078400	P.C.B. ASS'Y	DSP		
*	6	WG080800	P.C.B. ASS'Y	FUNCTION		
*	7	WG081000	P.C.B. ASS'Y	A-VIDEO		
*	8	WG081900	P.C.B. ASS'Y	D-VIDEO		
*	9	WG082700	P.C.B. ASS'Y	INPUT		
*	10	WG083600	P.C.B. ASS'Y	OPERATION		
*	11	WD048300	AM/FM TUNER	FAE385-A01F		
* ⚠	14	X7037A00	POWER TRANSFORMER			
	22	V8466600	DC FAN MOTOR 24V	DC D08A-24TG		
*	25	MF131120	FLEXIBLE FLAT CABLE	31P 120mm P=1.25		
	28	MF115140	FLEXIBLE FLAT CABLE	15P 140mm P=1.25		
*	29	MF127100	FLEXIBLE FLAT CABLE	27P 100mm P=1.25		
*	30	MF119070	FLEXIBLE FLAT CABLE	19P 70mm P=1.25		
	101	V9151100	TOP COVER			
*	103	WF554500	REAR PANEL			
	120	VV544300	LEG	D60xH21		
*	132	WE183300	KNOB D48	VOLUME		
*	133	WC560500	KNOB D23			
	145	V3198100	DAMPER	GUARD		
	150	VZ117100	DAMPER T2	TOP-F		
*	151	VS658200	DAMPER TR			
	161	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3		
	162	WE774400	BIND HEAD B-TIGHT SCREW	3x8 MFZN2B3		
	163	WE936300	BIND HEAD B-TIGHT SCREW	3x6 MFZN2W3		
	164	WE774600	SCREW IC	3x18 MFZN2W3		
	165	WE774700	BIND HEAD S-TIGHT SCREW	4x10 MFZN2W3		
	167	VT669300	PW HEAD B-TIGHT SCREW	3x8-8 MFC2		
	169	VK522100	SPECIAL S-TIGHT SCREW	4x8-10 MFC2BL		
	170	AA627310	GROUND TERMINAL			
	171	VH313200	PW HEAD S-TIGHT SCREW	4x8-10 MFNI3BL		
	173	WE774500	BIND HEAD B-TIGHT SCREW	3x30 MFZN2B3		
	174	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3		
	175	V6509600	JACK SCREW	SS6-A47511848		

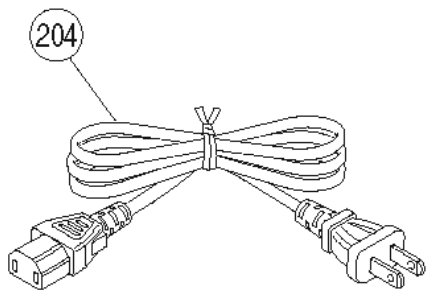
* New Parts

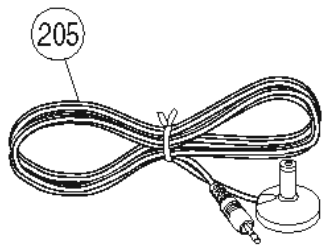
■ ACCESSORIES

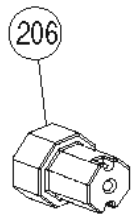










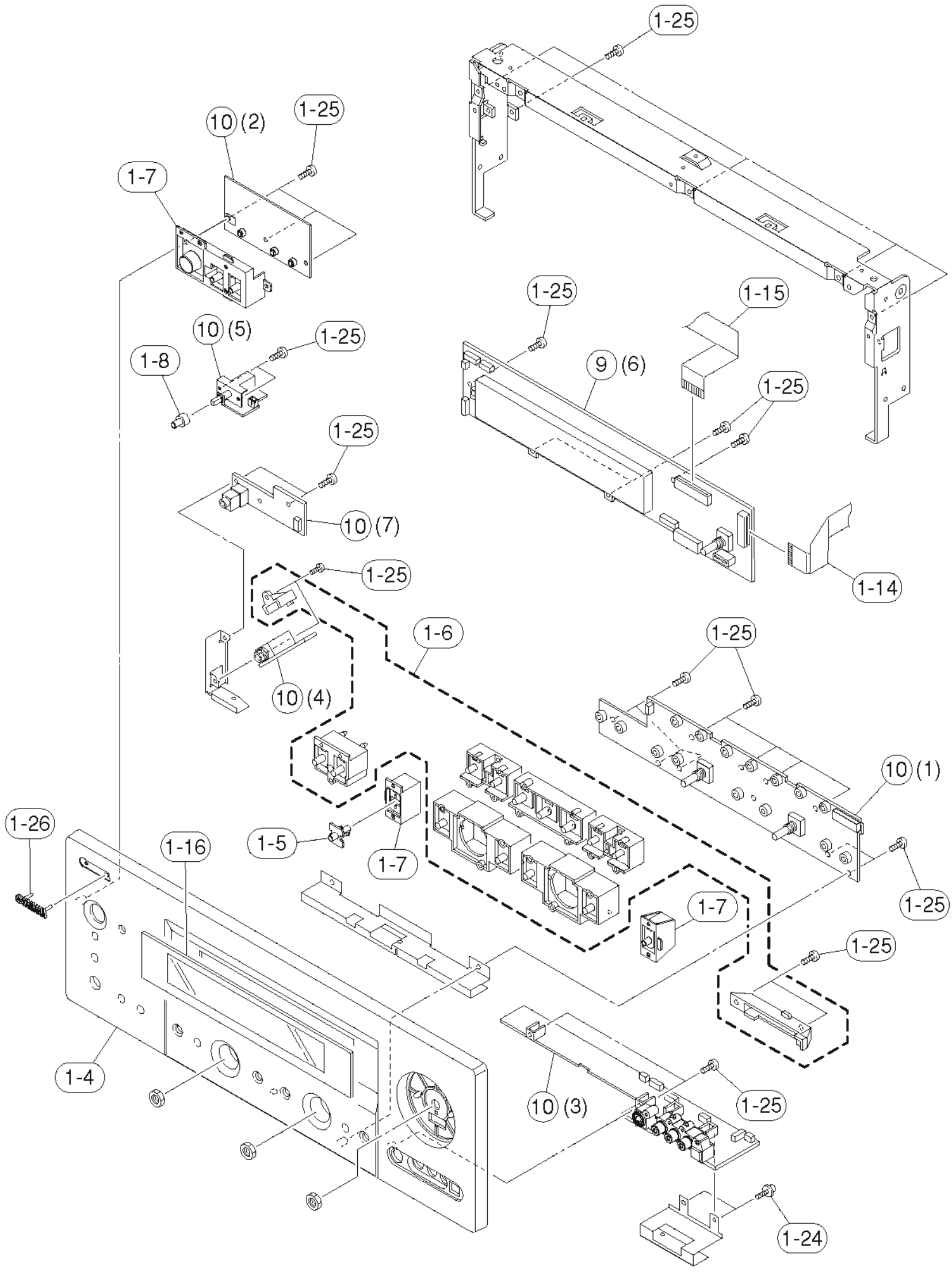


	Ref. No.	Part No.	Description		Remarks	Markets
			ACCESSORIES			
*	200	WF365400	REMOTE CONTROL	RAV356	RC1596007/00	
	200-1	AAX59640	BATTERY COVER		3139 238 08051	
	202	V6267000	INDOOR FM ANTENNA	1.4m 1pc		
	203	VR248500	AM LOOP ANTENNA	1.0m 1pc		
⚠	204	V7704800	POWER CABLE	2m 1pc		
	205	WB929200	OPTIMIZER MICROPHONE	EMX-251 6m 1pc		
	206	WC080100	SPEAKER TERMINAL WRENCH	LTS0090-0002GM 1pc		
			BATTERY (MANGANESE DRY)	UM-4E 4pcs		
			SERVICE TOOL			
		MF117350	FLEXIBLE FLAT CABLE	17P 350mm P=1.25		
		MF124500	FLEXIBLE FLAT CABLE	24P 500mm P=1.25		
		MF131500	FLEXIBLE FLAT CABLE	31P 500mm P=1.25		
*		MF404250	CRIMPING ASS'Y B&C	4P 250mm B&C		
*		MF405400	CRIMPING ASS'Y B&C	5P 400mm B&C		
*		MF408250	CRIMPING ASS'Y B&C	8P 250mm B&C		

* New Parts

HTR-5990

■ FRONT PANEL UNIT



	Ref. No.	Part No.	Description	Remarks	Markets
*	1-4	WF586400	FRONT PANEL ASS'Y		
	1-5	WC504300	LENS BUTTON		
*	1-6	WC491700	BUTTON CASE 5760		
*	1-7	WF552000	BUTTON 5990		
	1-8	V6001900	BUTTON D5		
	1-14	MF117100	FLEXIBLE FLAT CABLE	17P 100mm P=1.25	
*	1-15	MF124300	FLEXIBLE FLAT CABLE	24P 300mm P=1.25	
*	1-16	WF872200	SHEET WINDOW		
	1-24	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3	
	1-25	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3	
	1-26	V6034200	EMBLEM		
*	9	WG082700	P.C.B. ASS'Y	INPUT	
*	10	WG083600	P.C.B. ASS'Y	OPERATION	

* New Parts

■ AMP UNIT

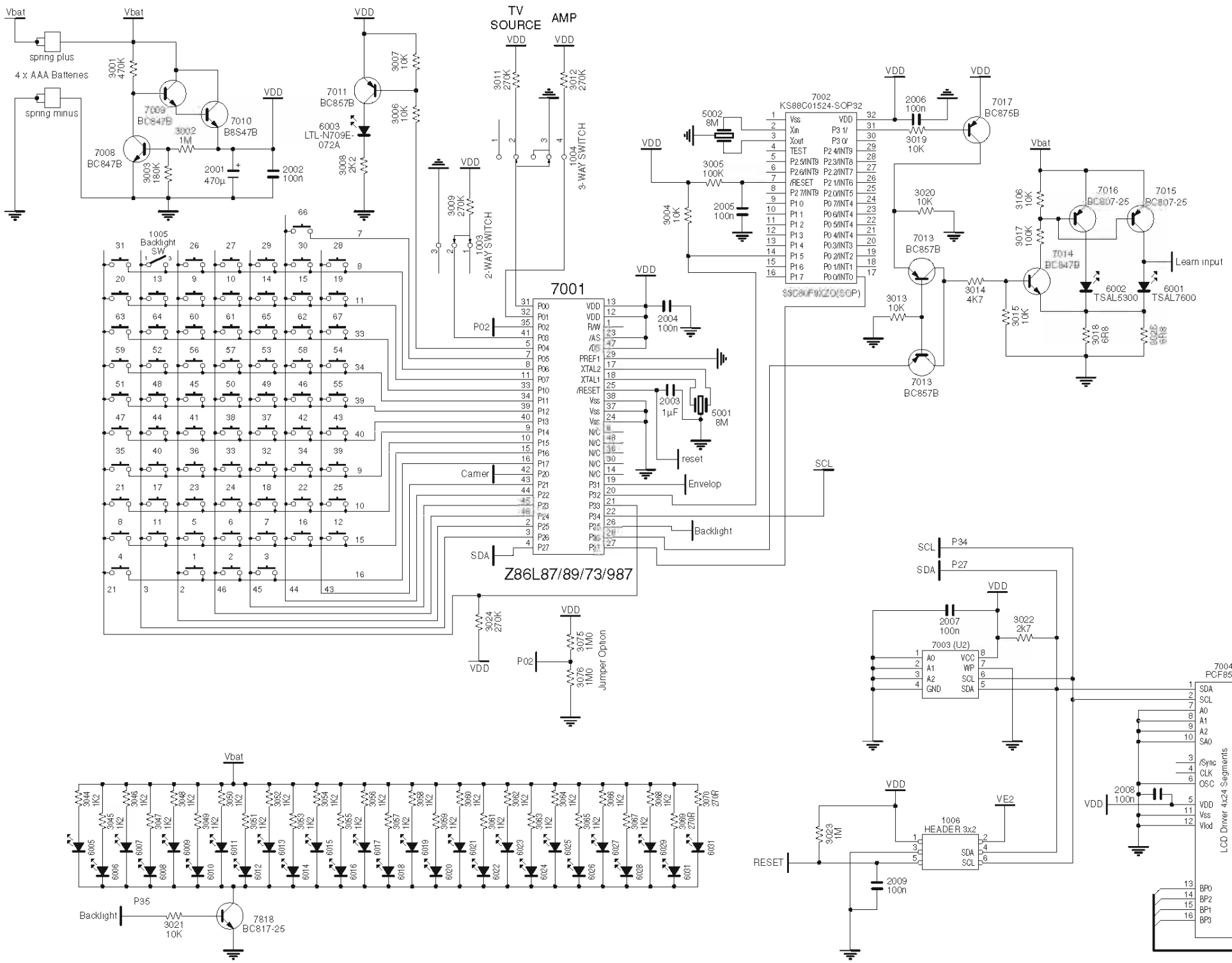
3-1 (5)
3-1 (1)
3-25
4 (4)
3-23
3-20
3-32
3-25
4 (7)
3-20
3-22
3-33
3-17
3-25
3-1 (3)
3-108
3-34
3-33
4 (3)
140
3-21
3-33
3-108
3-109
3-34
3-33
4 (5)
3-107
3-107
3-32
4 (1)
3-108
3-20
3-34
3-34
3-1 (2)
3-22
3-25
3-25
3-1 (4)
3-22
3-26
3-25
3-32
3-25
3-20
3-32
3-25
3-24
3-25

	Ref. No.	Part No.	Description	Remarks	Markets
*	3-1	WG075500	P.C.B. ASS'Y	MAIN	
*	3-17	WG432400	SUPPORT TR-6		
	3-20	WB297600	SUPPORT TR		
	3-21	WD418800	SUPPORT TR-9		
	3-22	VV849300	RADIATION SHEET	19x24	
	3-23	CB091290	SUPPORT P.C.B.	No.1645	
	3-24	WA207000	SHEET SHIELD B		
	3-25	VQ368600	PUSH RIVET	P3555-B	
	3-26	V9120600	DUCT		
	3-32	VK173200	SCREW TRANSISTOR	3x15 SP MFC2	
	3-33	VT669300	PW HEAD B-TIGHT SCREW	3x8-8 MFC2	
	3-34	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3	
	3-107	VP922500	DAMPER	2x10x170	
	3-108	V3198100	DAMPER	GUARD	
	3-109	VZ117100	DAMPER T2	TOP-F	
*	4	WG076400	P.C.B. ASS'Y	POWER	
	140	WG662000	BARRIER TRANS		

* New Parts

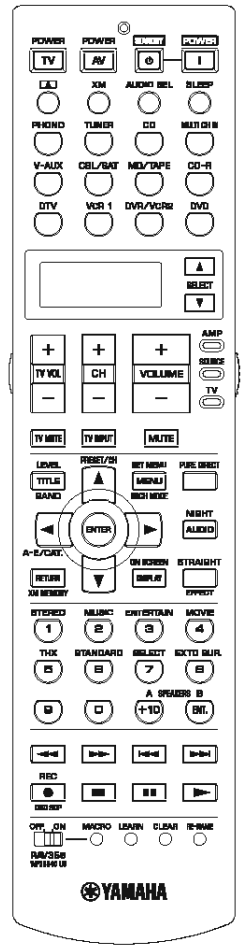
■ REMOTE CONTROL RAV 356

- SCHEMATIC DIAGRAM

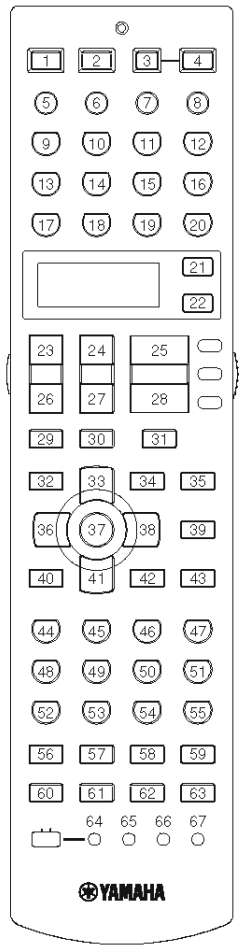


- REMOTE CONTROL PANEL

RAV356



• KEY NO. LAYOUT



• KEY CHART

NO	Label	AREA	LEARN	MACRO	Luminous or transparent	AMP Library AMPZ1: 2001 (default) MAIN	ZONE2	ZONE3	SYSTM	AMP Library AMPZ2: 2002 MAIN	ZONE2	ZONE3	SYSTM
-	LED	–	–	–	–	–	–	–	–	–	–	–	–
	SW2 (MACRO ON/OFF)												
3	STANDBY	1	O	O	O	7E-7F	7E-BB	7A-EE	7A-1E	7D-B1	7D-63	7D-73	7D-91
4	POWER on	1	O	O	O	7E-7E	7E-BA	7A-ED	7A-1D	7D-B2	7D-64	7D-74	7D-90
5	A	1	O	O	–	–	–	–		–	–	–	
6	XM/B	1	O	O	–	7A-B4/-	7A-B8/-	7A-B9/-		7D-29/-	7D-2F/-	7D-30/-	
9	PHONO	1	O	O	–	7A-14	7A-D0	7A-F1		7D-88	7D-65	7D-75	
10	TUNER	1	O	O	–	7A-16	7A-D2	7A-F3		7D-89	7D-66	7D-76	
11	CD	1	O	O	–	7A-15	7A-D1	7A-F2		7D-87	7D-67	7D-77	
12	MULTI CH INPUT	1	O	O	–		7A-87				7D-8C		
13	V-AUX	1	O	O	–	7A-55	7A-D8	7A-F0		7D-8A	7D-68	7D-78	
14	CBL/SAT	1	O	O	–	7A-C0	7A-CC	7A-F7		7D-96	7D-69	7D-79	
15	MD/TAPE	1	O	O	–	7A-18	7A-D3	7A-F4		7D-8B	7D-6A	7D-7A	
16	CD-R	1	O	O	–	7A-19	7A-D4	7A-F5		7D-99	7D-6B	7D-7B	
17	DTV	1	O	O	–	7A-54	7A-D9	7A-F6		7D-84	7D-6C	7D-7C	
18	VCR1	1	O	O	–	7A-0F	7A-D6	7A-F9		7D-81	7D-6D	7D-7D	
19	DVR/VCR2	1	O	O	–	7A-13	7A-D7	7A-FA		7D-82	7D-6E	7D-7E	
20	DVD	1	O	O	–	7A-C1	7A-CD	7A-FC		7D-97	7D-6F	7D-7F	
21	SELECT up	1	–	–	O	–	–	–	–	–	–	–	–
22	SELECT down	1	–	–	O	–	–	–	–	–	–	–	–
	SW1 (SOURCE/AMP/TV)												
1	TV POWER	16	O	–	O	–>				–>			
2	AV POWER	16	O	–	O	–>				–>			
7	INPUT MODE	1	O	–	–	7A-C3				7D-80			
8	SLEEP	1	O	–	–	7A-57				7D-93			
23	TV VOL up	16	O	–	O	–>				–>			
24	CH up	16	O	–	O	–>				–>			
25	VOL up	1	O	–	O	7A-1A	7A-DA	7A-FD		7D-8D	7D-70	7D-20	
26	TV VOL down	16	O	–	O	–>				–>			
27	CH down	16	O	–	O	–>				–>			
28	VOL down	1	O	–	O	7A-1B	7A-DB	7A-FE		7D-8E	7D-71	7D-21	
29	TV mute	16	O	–	O	–>				–>			
30	TV input	16	O	–	O	–>				–>			
31	MUTE	1	O	–	O	7A-1C	7A-DC	7A-FF		7D-94	7D-72	7D-22	
32	TITLE	16	O	–	O	7A-86				7D-95			
33	Up	16	O	–	O	7A-98				7D-B6			
34	MENU	16	O	–	O	7A-9C				7D-9C			
35	Pure Direct	1	O	–	O	7A-DD				7D-C0			
36	Left	16	O	–	O	7A-53				7D-B9			
37	Enter	16	O	–	O	7A-DE				7D-56			
38	Right	16	O	–	O	7A-52				7D-B8			
39	AUDIO	16	O	–	O	7A-95				7D-DD			
40	RETURN	16	O	–	O	7A-AA				7D-B5			
41	Down	16	O	–	O	7A-99				7D-B7			
42	DISPLAY	16	O	–	O	7A-C2				7D-C2			
43	STRAIGHT	1	O	–	O	7A-56				7D-C1			
44	PRG1	16	O	–	–	7A-88				7D-D0			
45	PRG2	16	O	–	–	7A-89				7D-D1			
46	PRG3	16	O	–	–	7A-8A				7D-D2			
47	PRG4	16	O	–	–	7A-8B				7D-D3			
48	PRG5	16	O	–	–	7A-8C				7D-D4			
49	PRG6	16	O	–	–	7A-8D				7D-D5			
50	PRG7	16	O	–	–	7A-96				7D-DE			
51	PRG8	16	O	–	–	7A-97				7D-DF			
52	PRG9	16	O	–	–	7A-A8				7D-B3			
53	PRG10	16	O	–	–	7A-A9				7D-B4			
54	PRG11	16	O	–	–	7A-9A				7D-E7			
55	PRG12	16	O	–	–	7A-9B				7D-E8			
56	REW (SEARCH)	16	O	–	–	–>				–>			
57	FF (SEARCH)	16	O	–	–	–>				–>			
58	CHP/SKIP-	16	O	–	–	–>				–>			
59	CHP/SKIP+	16	O	–	–	–>				–>			
60	REC	16	O	–	–	–>				–>			
61	STOP	16	O	–	–	–>				–>			
62	PAUSE	16	O	–	–	–>				–>			
63	PLAY	16	O	–	–	–>				–>			
64	MACRO	–	–	–	–	–	can not use			–	can not use		
65	LEARN	–	–	–	–	–	can not use			–	can not use		
66	CLEAR	–	–	–	–	–	can not use			–	can not use		
67	RE-NAME	–	–	–	–	–	can not use			–	can not use		

Linked with IR signal			LCD Display		Default Preset		
OFF	ON		5 letters	3 letters	Library	Brand	Brand No
Power STANDBY	Macro feature			STB			
Power ON				PWR			
Output IR signal & change Device mode	Macro feature & change Device mode		A	A	TAPE	YAMAHA1	2700
			XM/B	XM/B	TUNER/LD	YAMAHA5/1	2604/2200
Output IR signal & change Device mode	Macro feature & change Device mode		PHONO	PHO	TV	nothing	nothing
			TUNER	TUN	TUNER	YAMAHA3	2602
			CD	CD	CD	YAMAHA1	2300
Output IR signal & change Device mode	Macro feature & change Device mode		MULTI	MLT	DVD	YAMAHA3	2102
Output IR signal & change Device mode	Macro feature & change Device mode		V-AUX	AUX	VCR	noting	nothing
			CBSAT	SAT	CABLE	nothing	nothing
			MD	MD	MD	YAMAHA1	2500
			CD-R	CDR	CD-R	YAMAHA	2400
			DTV	DTV	TV	nothing	nothing
			VCR1	VR1	VCR	nothing	nothing
			DVR	DVR	DVR	YAMAHA	2807
			DVD	DVD	DVD	YAMAHA3	2102
Select Device mode(up)							
Select Device mode(down)							

SOURCE																AMP	TV
20	19	18	17	16	15	14	13	12	11	10	9	6		5	Option		
DVD	DVR/VCR2	VCR1	DTV	CD-R	MD/TAPE	CBL/SAT	V-AUX	MULTI	CD	TUNER	PHONO	B	XM	A	OPTN		
(TV Power)	(TV Power)	(TV Power)	Power	(TV Power)	(TV Power)	(TV Power)	(TV Power)	(TV Power)	(TV Power)	(TV Power)	Power	(TV Power)	(TV Power)	(TV Power)	(TV Power)	(TV Power)	Power
Power	Power	Power	(VCR1 Power)	Power	Power	Power	Power	Power	Power	Power	(VCR1 Power)	Power	Power	Power	–	(device)	(device)
INPUT MODE																	
SLEEP																	
(TV VOL up)	(TV VOL up)	(TV VOL up)	TV VOL up	(TV VOL up)	(TV VOL up)	(TV VOL up)	(TV VOL up)	(TV VOL up)	(TV VOL up)	(TV VOL up)	TV VOL up	(TV VOL up)	(TV VOL up)	(TV VOL up)	(TV VOL up)	(TV VOL up)	TV VOL up
(TV CH up)	(TV CH up)	CH up	CH up	(TV CH up)	(TV CH up)	CH up	CH up	(TV CH up)	(TV CH up)	(TV CH up)	CH up	(TV CH up)	(TV CH up)	(TV CH up)	(TV CH up)	(device)	CH up
VOL up																	
(TV VOL down)	(TV VOL down)	(TV VOL down)	TV VOL down	(TV VOL down)	(TV VOL down)	(TV VOL down)	(TV VOL down)	(TV VOL down)	(TV VOL down)	(TV VOL down)	TV VOL down	(TV VOL down)	(TV VOL down)	(TV VOL down)	(TV VOL down)	(TV VOL down)	TV VOL down
(TV CH down)	(TV CH down)	CH down	CH down	(TV CH down)	(TV CH down)	CH down	CH down	(TV CH down)	(TV CH down)	(TV CH down)	CH down	(TV CH down)	(TV CH down)	(TV CH down)	(TV CH down)	(device)	CH down
VOL down																	
(TV mute)	(TV mute)	(TV mute)	TV mute	(TV mute)	(TV mute)	(TV mute)	(TV mute)	(TV mute)	(TV mute)	TV mute	TV mute	(TV mute)	(TV mute)	(TV mute)	(TV mute)	(TV mute)	TV mute
(TV Input)	(TV Input)	(TV input)	TV input	(TV Input)	(TV input)	(TV input)	(TV input)	(TV input)	(TV input)	(TV input)	TV input	(TV Input)	(TV input)	(TV Input)	(TV input)	(TV input)	TV input
MUTE																	
Title	Title	Title	Title	–	–	Title	Title	Title	–	BAND	Title	–	BAND	–	–	LEVEL	Title
Menu up	Menu up	–	Menu up	–	–	Menu up	–	Menu up	–	PRESET+	Menu up	–	PRESET+	–	–	Menu up	Menu up
MENU	MENU	–	MENU	–	–	Menu	–	MENU	–	SRCH MODE	MENU	–	SRCH MODE	–	–	SET MENU	MENU
Pure Direct																	
Menu left	Menu left	–	Menu left	–	–	Menu left	–	Menu left	–	A-B, CAT -	Menu left	–	A-B, CAT -	–	–	Menu left	Menu left
Menu enter	Menu enter	–	Menu select	–	–	Menu select	–	Menu enter	–	ENTER	Menu select	–	ENTER	–	–	Menu select	Menu select
Menu right	Menu right	–	Menu right	–	–	Menu right	–	Menu right	–	A-E, CATE +	Menu right	–	A-E, CATE +	A/B	–	Menu right	Menu right
Audio	Audio	–	–	–	–	–	–	Audio	–	–	–	Audio	–	–	–	NIGHT	(device)
Return	Return	Return	Return	–	–	Return	Return	Return	–	MEMORY	Return	–	MEMORY	–	–	RETURN	Return
Menu down	Menu down	–	Menu down	–	–	Menu down	–	Menu down	–	PRESET-	Menu down	–	PRESET-	–	–	Menu down	Menu down
Display	Display	–	Display	Display	Display	Display	–	Display	Display	DISPLAY	Display	Display	DISPLAY	–	–	ON SCREEN	Display
STRAIGHT																	
1	1	1	1	1	1	1	1	1	1	P1	1	1	P1	–	–	PRG1	1
2	2	2	2	2	2	2	2	2	2	P2	2	2	P2	–	–	PRG2	2
3	3	3	3	3	3	3	3	3	3	P3	3	3	P3	–	–	PRG3	3
4	4	4	4	4	4	4	4	4	4	P4	4	4	P4	–	–	PRG4	4
5	5	5	5	5	5	5	5	5	5	P5	5	5	P5	–	–	PRG5	5
6	6	6	6	6	6	6	6	6	6	P6	6	6	P6	–	–	PRG6	6
7	7	7	7	7	7	7	7	7	7	P7	7	7	P7	–	–	SELECT	7
8	8	8	8	8	8	8	8	8	8	P8	8	8	P8	–	–	Extra	8
9	9	9	9	9	9	9	9	9	9	P9	9	9	P9	–	–	Home A	9
0	0	0/10	0/10	0/10	0/10	0/10	0/10	0	0/10	P0	0/10	0	P0	–	–	Home B	0/10
+10	+10	>10	_/__11	+10	+10	_/__	>10	+10	+10	–	_/__11	+10	–	–	–	SP A	_/__11
Title/index	Title/index	enter	enter/12	index	index	enter/recall	enter	Title/index	index	P ENTER	enter/12	CHP/Time	P ENTER	–	–	SP B	enter/12
Rew	Rew	Rew	(VCR1Rew)	Rew	Rew	(VCR1Rew)	Rew	Rew	Rew	FREQ	(VCR1Rew)	Rew	FREQ	Rew	–	(device)	(device)
FF	FF	FF	(VCR1 FF)	FF	FF	(VCR1 FF)	FF	FF	FF	EON	(VCR1 FF)	FF	EON	FF	–	(device)	(device)
Skip-	Skip-	–	–	Skip-	Skip-	–	–	Skip-	Skip-	PTYMODE	–	Chap/Skip-	PTYMODE	DIR A	–	(device)	(device)
Skip+	Skip+	–	–	Skip+	Skip+	–	–	Skip+	Skip+	PTYSTART	–	Chap/Skip+	PTYSTART	DIR B	–	(device)	(device)
Disk skip	REC	REC	(VCR1 REC)	REC	REC	(VCR1 REC)	REC	Disk skip	Disk skip	–	(VCR1 REC)	–	–	REC	–	(device)	(device)
Stop	Stop	Stop	(VCR1 Stop)	Stop	Stop	(VCR1 Stop)	Stop	Stop	Stop	–	(VCR1 Stop)	Stop	–	Stop	–	(device)	(device)
Pause	Pause	Pause	(VCR1 Pause)	Pause	Pause	(VCR1 Pause)	Pause	Pause	Pause	–	(VCR1 Pause)	Pause	–	Pause	–	(device)	(device)
Play	Play	Play	(VCR1 Play)	Play	Play	(VCR1 Play)	Play	Play	Play	–	(VCR1 Play)	Play	–	Play	–	(device)	(device)
Change to MACRO mode																	
Change to LEARNING or PRESET mode																	
Change to CLEAR mode(Macro clear, Rename clear, Preset clear, All key clear)																	
Change to RE-NAME mode																	

ADVANCED SETUP

This unit has additional menus that are displayed in the front panel display. The ADVANCED SETUP menu offers additional operations to adjust and customize the way this unit operates. Change the initial settings (indicated in bold under each parameter) to reflect the needs of your listening environment.

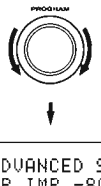
Using ADVANCED SETUP

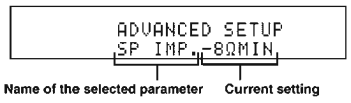
1 Press MASTER ON/OFF on the front panel to release it outward to the OFF position to set this unit, Zone 2 and Zone 3 to the standby mode.

2 Press and hold STRAIGHT (EFFECT) on the front panel and then press MASTER ON/OFF inward to the ON position to turn on the power of this unit.

3 Rotate the PROGRAM selector on the front panel to select the parameter you want to adjust.

The name of the selected parameter appears in the front panel display.
See pages 88 and 89 for a complete list of available parameters.





4 Press STRAIGHT (EFFECT) on the front panel repeatedly to change the setting.

5 Press MASTER ON/OFF on the front panel to release it outward to the OFF position to save the new setting and set this unit, Zone 2 and Zone 3 to the standby mode.

The new setting is activated next time you press MASTER ON/OFF inward to the ON position to turn on the power of this unit, Zone 2 and Zone 3.

Notes

- The control buttons on the remote control and VOLUME as well as the other control buttons on the front panel except MASTER ON/OFF, STRAIGHT (EFFECT) and the PROGRAM selector are ineffective while you are using the ADVANCED SETUP menu.
- Zone 2, Zone 3 and the speaker relay are all turned off and all audio and video output is muted while you are using the ADVANCED SETUP menu.
- The ADVANCED SETUP menu is only available in the front panel display.

■ Speaker impedance SP IMP.

Use to set the impedance of this unit so that it matches that of your speakers.
Choices: 6ΩMIN, **8ΩMIN**

- Select 6ΩMIN for speakers with 6 ohms or higher.
- Select 8ΩMIN for speakers with 8 ohms or higher.

■ User preset PRESET

Use to reset all the parameters of this unit to the initial factory settings with the exception of System Memory and AUTO SETUP settings.
Choices: **CANCEL**, RESET

- Select CANCEL if you do not want to reset the parameters of this unit.
- Select RESET to reset the parameters of this unit.

Notes

- This setting does not affect the ADVANCED SETUP menu item parameters.
- The initial factory settings are activated next time you turn on the power of this unit.

■ Remote sensor REMOTE SEN

Use to activate or deactivate the signal-receiving capability of the remote control sensor on the front panel of this unit.
Choices: **ON**, OFF

- Select ON if you want to activate the signal-receiving capability of the remote control sensor.
- Select OFF if you want to deactivate the signal-receiving capability of the remote control sensor.

Note

We recommend setting this parameter to ON in most cases.

■ Wake on RS-232C access WAKE ON 232C

Use to set this unit to transmit data via the RS-232C interface when this unit is in the standby mode.
Choices: **Y** (yes), N (no)

- Select Y set this unit to transmit data via the RS-232C interface.
- Select N set this unit not to transmit data via the RS-232C interface.

■ Remote control AMP ID REMOTE AMP

Use to set the AMP ID of this unit for remote control recognition (see page 93).
Choices: **ID1**, ID2

- Select ID1 when the remote control AMP library code is set to 2001.
- Select ID2 when the remote control AMP library code is set to 2002.

Note

You need to set the corresponding remote control code for the remote control.

■ Remote control tuner ID REMOTE TUN

Use to set the tuner ID of this unit for remote control recognition (see page 93).
Choices: **ID1**, ID2

- Select ID1 when the remote control tuner library code is set to 2602.
- Select ID2 when the remote control tuner library code is set to 2603.

Note

You need to set the corresponding remote control code for the remote control.

■ Remote control XM ID REMOTE XM

Use to switch the XM-related remote control codes between ID1 and ID2.
Choices: **ID1**, ID2

- Select ID1 when the remote control XM library code is set to 2604.
- Select ID2 when the remote control XM library code is set to 2605.

Note

You need to set the corresponding remote control code for the remote control.

■ Fan operation mode FAN MODE

Use to set the operation of the cooling fan of this unit.
Choices: **AUTO**, CONT.

- Select AUTO to set the fan to operate automatically according to the temperature of this unit.
- Select CONT. to set the fan to operate continuously regardless of the temperature of this unit.

■ Bi-AMP BI-AMP

Use to activate or deactivate the bi-AMP function.
Choices: ON, **OFF**

- Select ON if you want to activate the bi-AMP function.
- Select OFF if you want to deactivate the bi-AMP function.

Note

When BI-AMP is set to ON, the SURROUND BACK terminals cannot be used to connect surround back speakers in that the SURROUND BACK terminals are already used for the bi-AMP connection (see page 17).

■ Video reset V-RESET

Use to initialize the parameter settings for DISPLAY SET in OPTION MENU (see page 83). This feature is useful if the SET MENU items are not displayed on your video monitor due to a technical error between the CMPNT I/P setting and the capability of your video monitor. That is, if your video monitor does not support the analog video signals with 480p of resolution, the SET MENU items may not be displayed on your video monitor when CMPNT I/P is set to ON (see page 83).
Choices: YES, **CANCEL**

Note

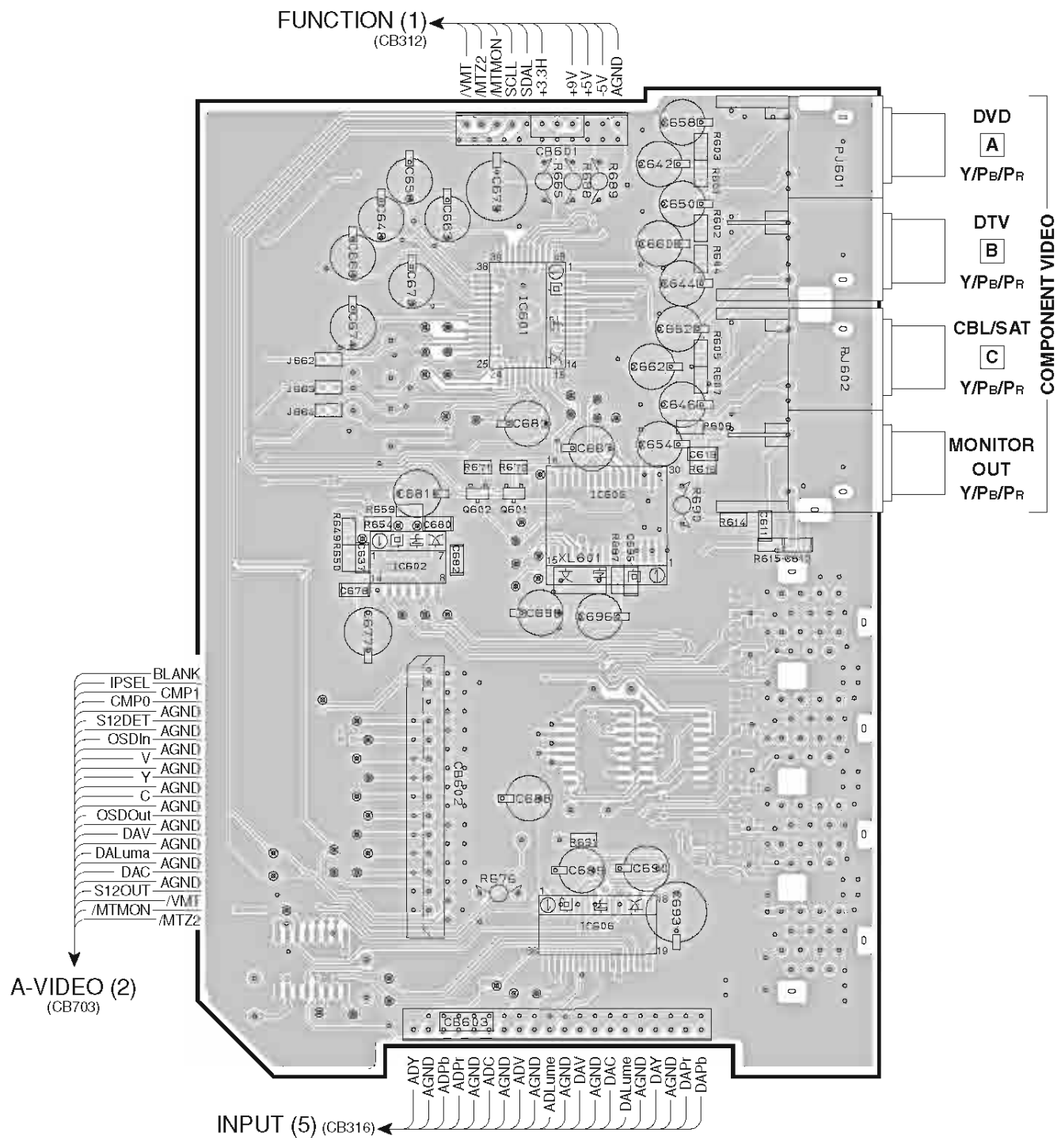
The parameter setting for DIMMER is not initialized (see page 83).

YAMAHA

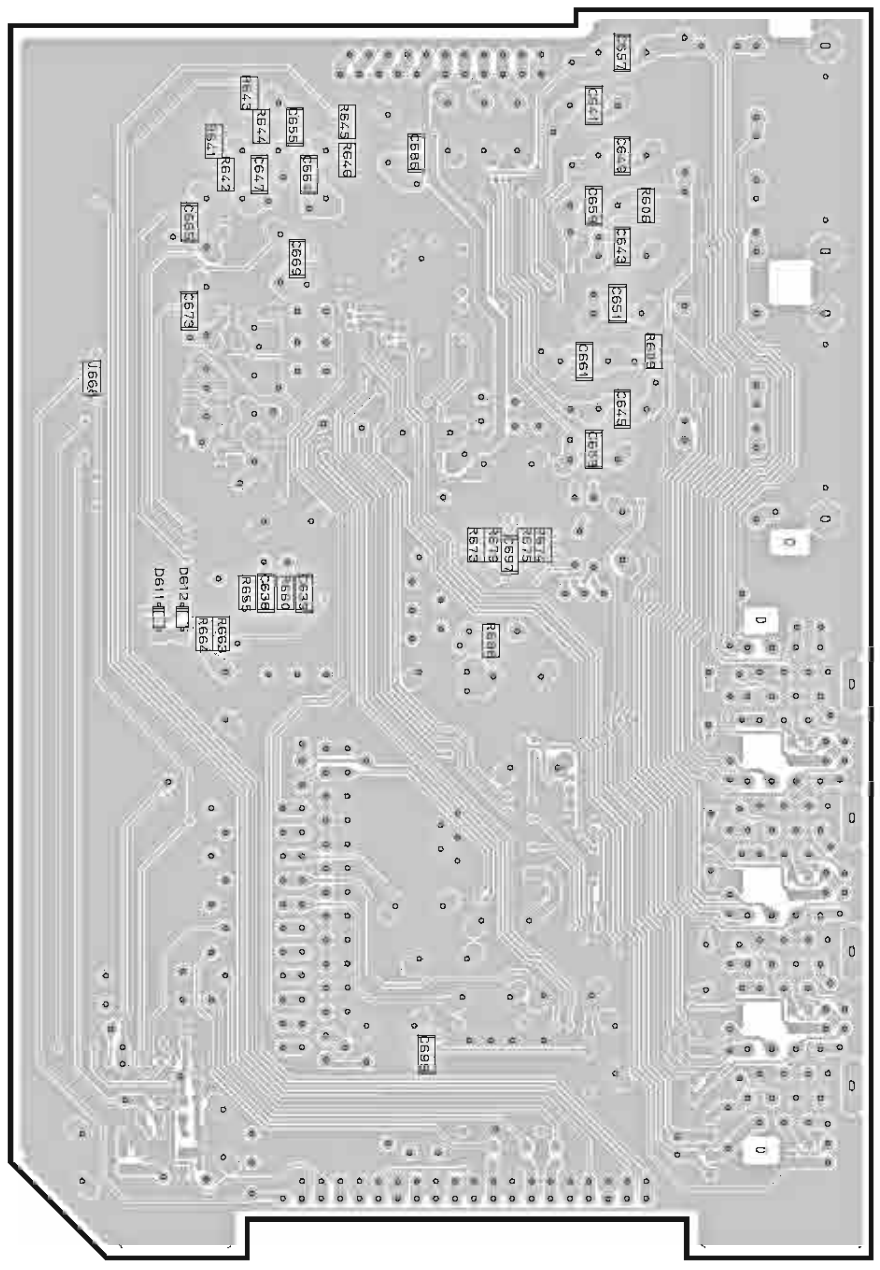
HTR-5990

■ PRINTED CIRCUIT BOARD

A-VIDEO (1) P.C.B. (Side A) Lead Free Solder Used



A-VIDEO (1) P.C.B. (Side B) Lead Free Solder Used

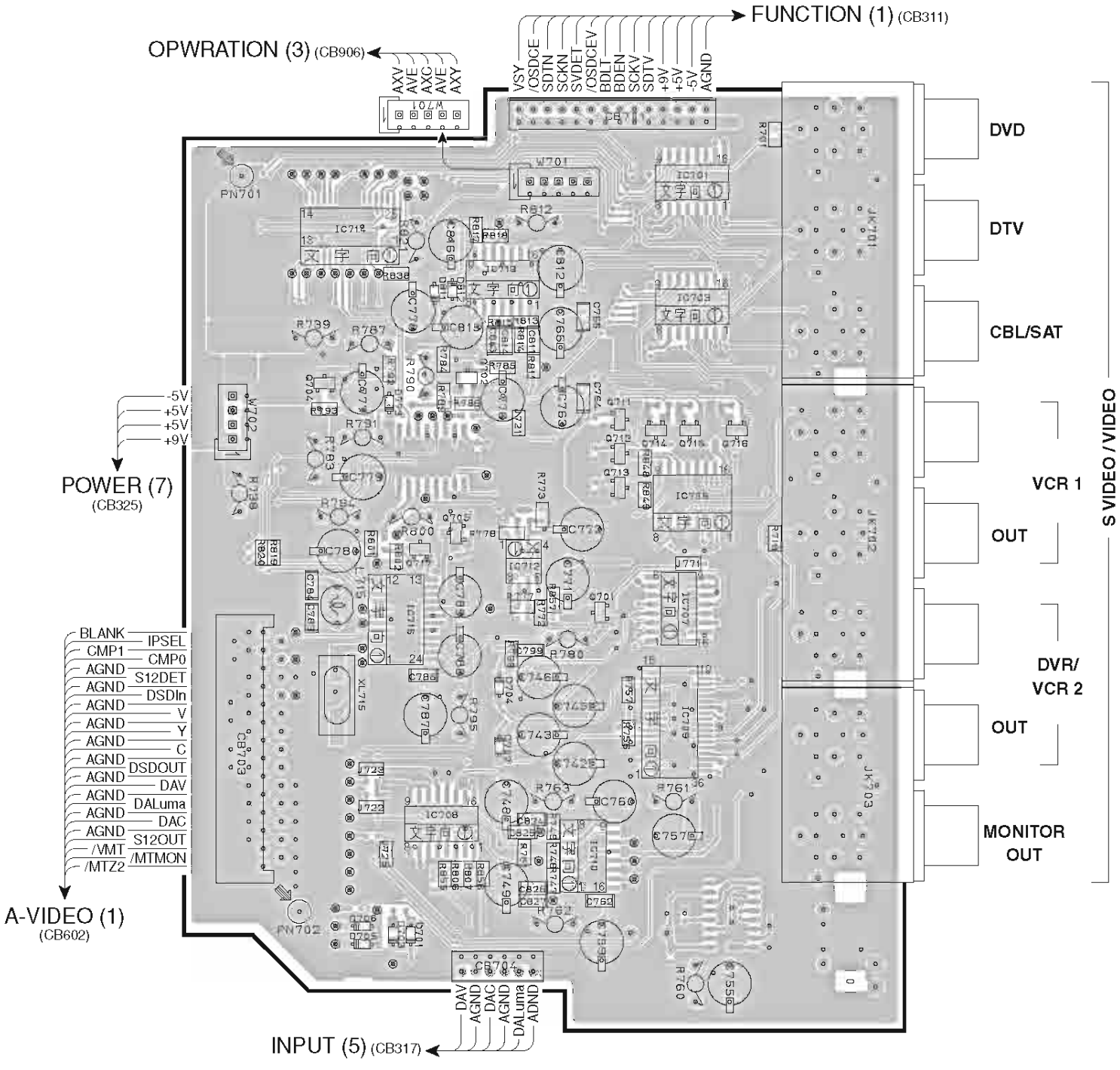


- **Semiconductor Location**

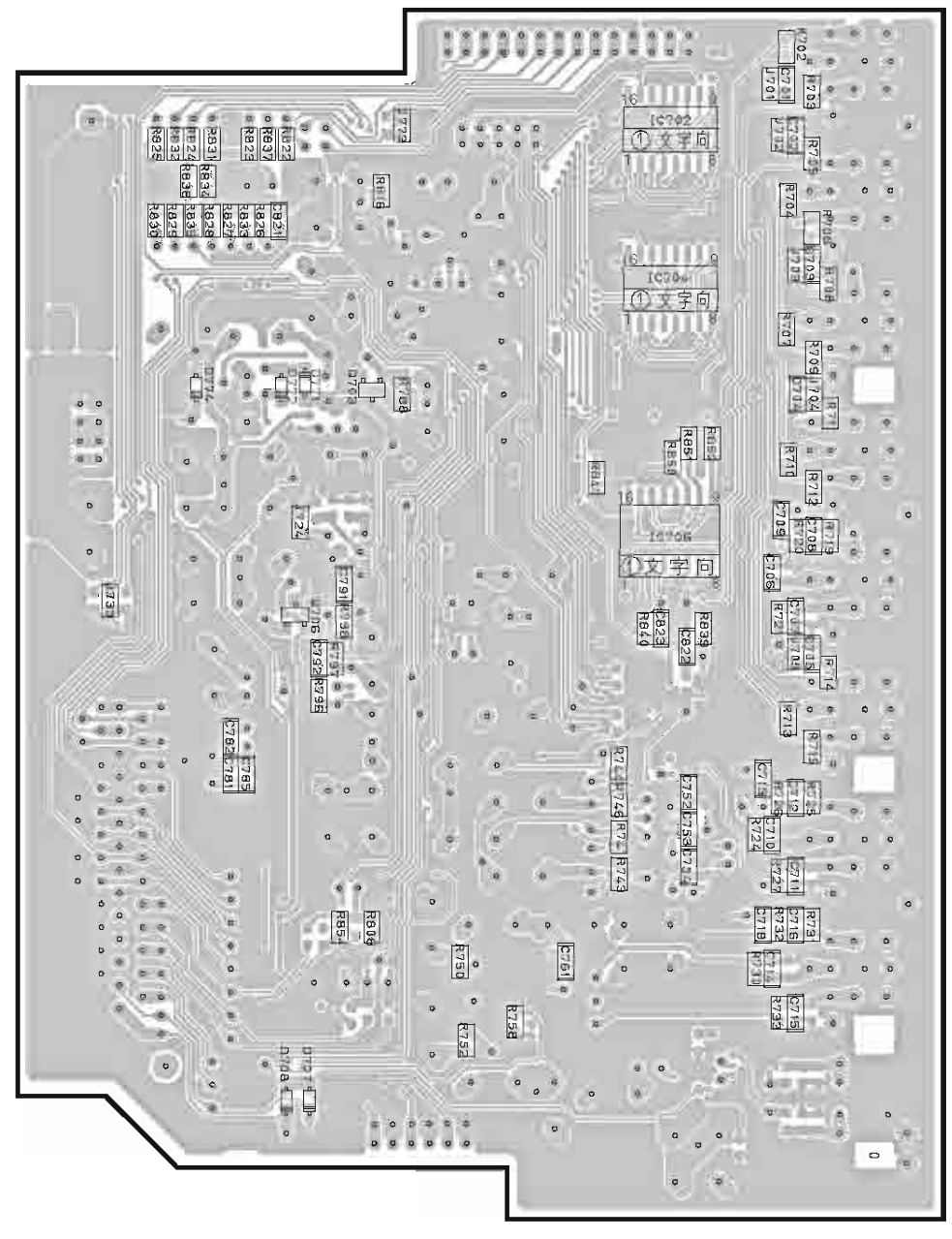
Ref no.	Location
D611	F4
D612	G4
IC601	C3
IC602	C4
IC605	C4
IC606	C6
IC607	–
Q601	C4
Q602	C4

■ PRINTED CIRCUIT BOARD

A-VIDEO (2) P.C.B. (Side A) Lead Free Solder Used



A-VIDEO (2) P.C.B. (Side B) Lead Free Solder Used

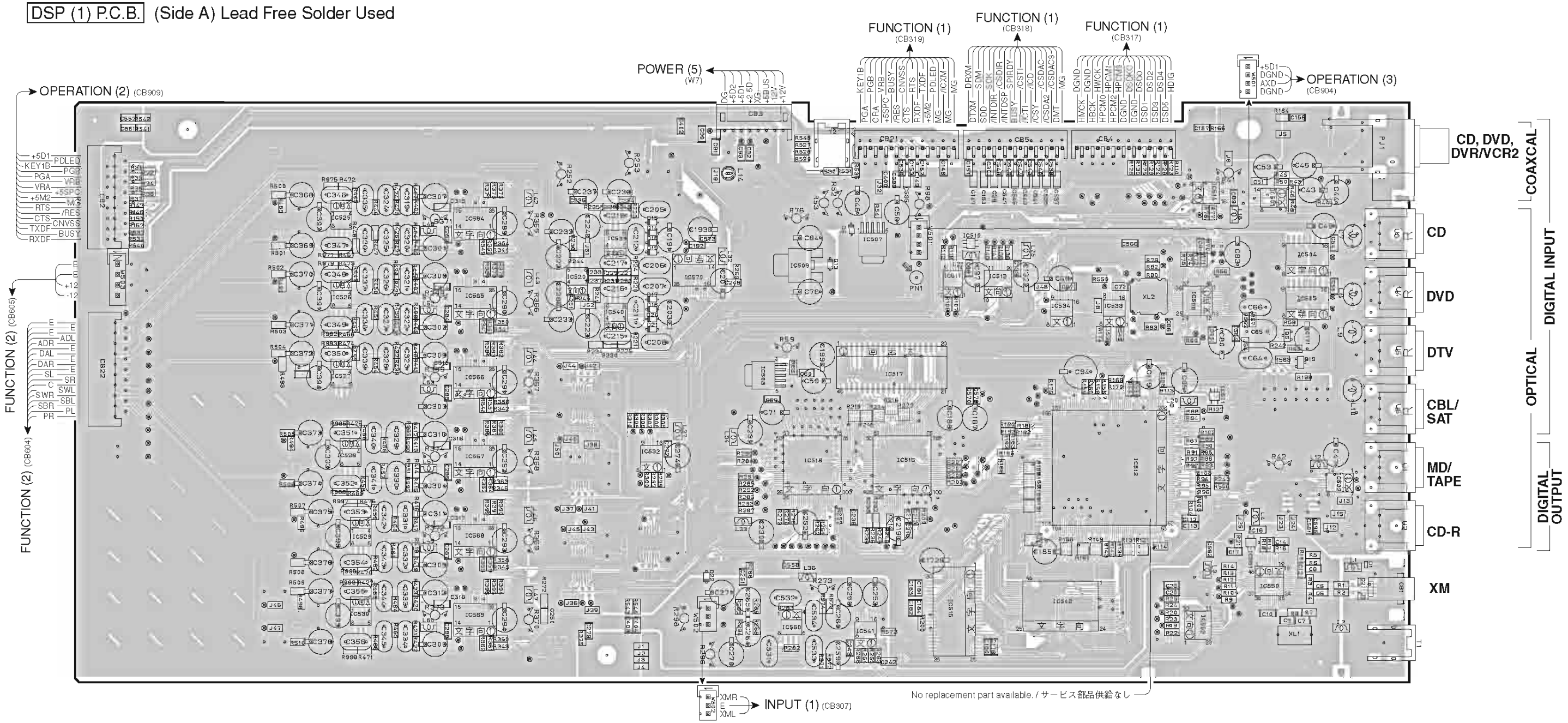


• **Semiconductor Location**

Ref no.	Location
D701	C6
D702	C5
D703	B6
D704	C5
D705	B6
D706	B6
D707	G5
D708	G5
D771	G3
D772	G3
D773	B3
D774	G3
D811	C3
D812	C3
IC701	D2
IC702	I2
IC703	D3
IC704	I3
IC705	D4
IC706	I4
IC707	D4
IC708	C5
IC709	D5
IC710	C5
IC712	C4
IC713	C3
IC714	B3
IC715	C4
IC716	–
Q701	C4
Q702	C3
Q703	H3
Q704	B3
Q705	C4
Q706	G4
Q711	D3
Q712	D4
Q713	D4
Q714	D4
Q715	D4
Q716	D4
Q717	C4

■ PRINTED CIRCUIT BOARD

DSP (1) P.C.B. (Side A) Lead Free Solder Used

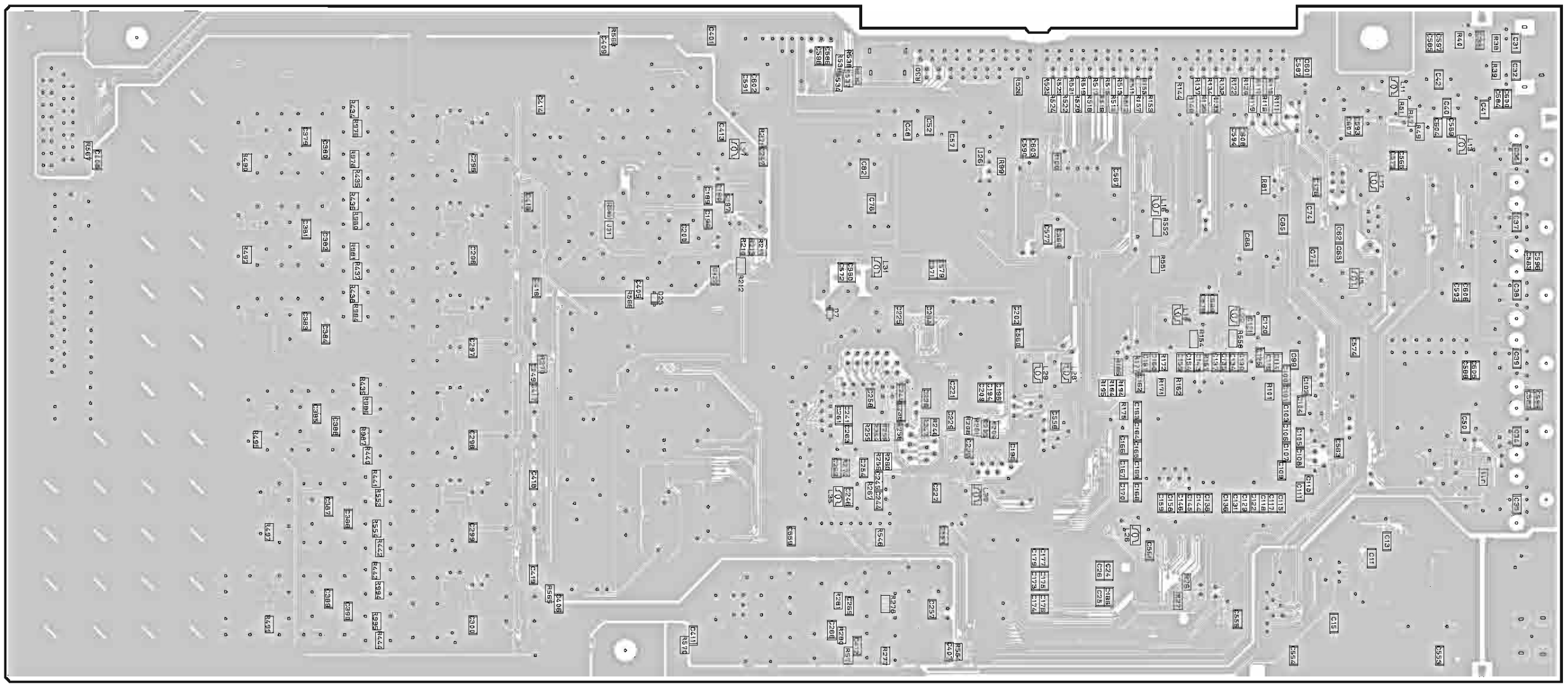


• **Semiconductor Location**

Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
D1	I5	D20	E3	IC510	G3	IC526	C3	IC542	G5	IC570	E3
D2	I5	D21	E3	IC511	G3	IC527	C4	IC550	I5	IC571	H4
D3	I5	D22	E5	IC512	H4	IC528	C4	IC551	I5	Q6	I4
D5	F3	IC501	I3	IC513	G3	IC529	C5	IC552	H5	Q19	I4
D13	F3	IC502	I4	IC514	H3	IC530	C5	IC560	F5		
D14	E3	IC504	I3	IC515	G5	IC532	E4	IC564	D3		
D15	E3	IC505	I3	IC516	G4	IC533	H3	IC565	D3		
D16	E3	IC506	H3	IC517	F4	IC534	H3	IC566	D4		
D17	E3	IC507	F3	IC518	F4	IC539	E3	IC567	D4		
D18	E3	IC508	F4	IC520	D3	IC540	E3	IC568	D5		
D19	E3	IC509	F3	IC525	C3	IC541	F5	IC569	D5		

■ PRINTED CIRCUIT BOARD

DSP (1) P.C.B. (Side B) Lead Free Solder Used

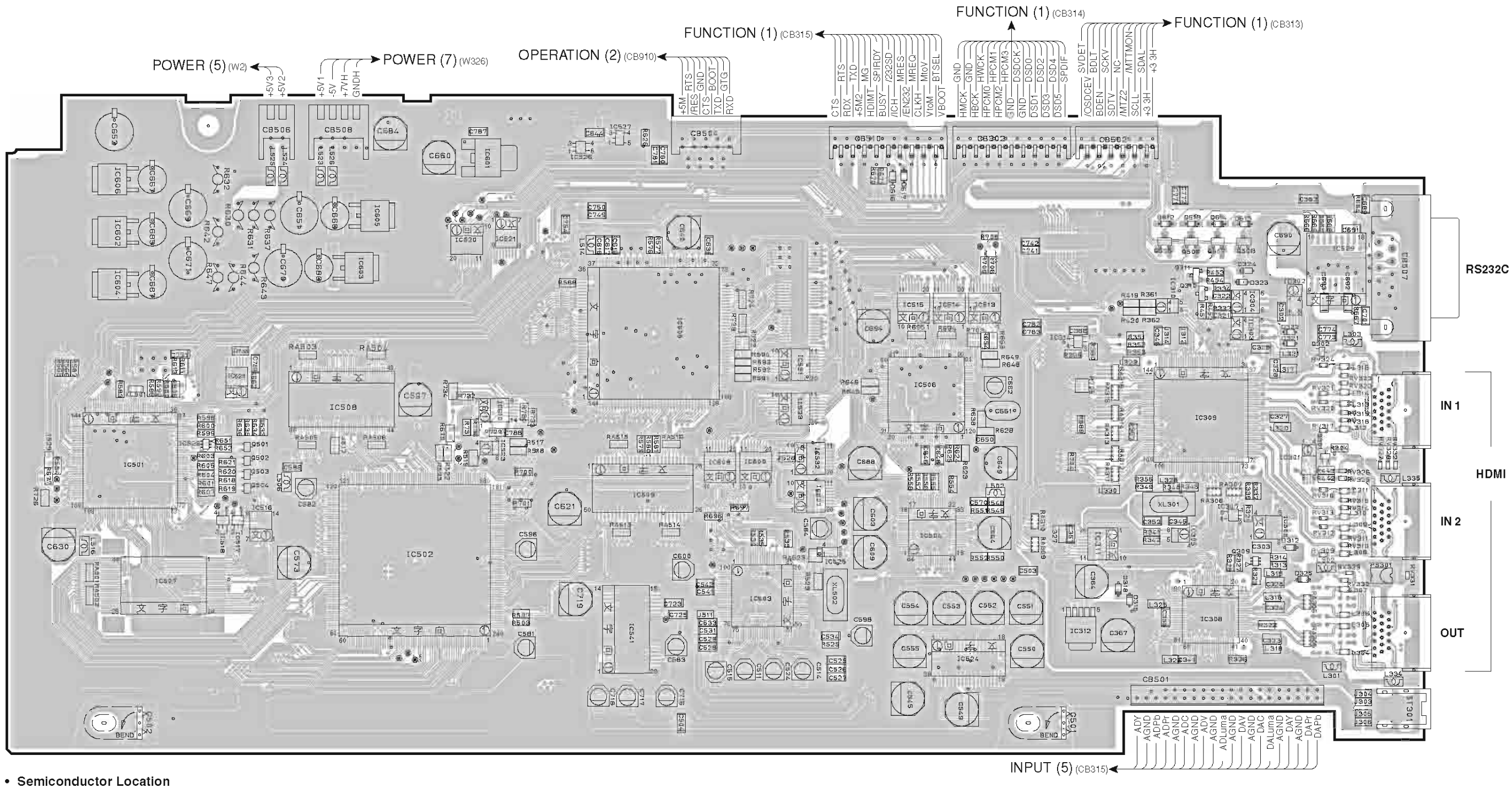


• **Semiconductor Location**

Ref no.	Location
D7	F3
D23	E3

■ PRINTED CIRCUIT BOARD

D-VIDEO P.C.B. (Side A) Lead Free Solder Used



• **Semiconductor Location**

Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
D312	I5	D324	I3	D616	F3	IC305	H5	IC311	H5	IC504	G5	IC510	–	IC516	C5
D315	H5	D325	I5	D617	G3	IC306	I5	IC312	H6	IC505	E4	IC511	–	IC517	B5
D318	H5	D612	H3	IC301	I4	IC307	I5	IC314	H4	IC506	G4	IC512	–	IC518	B5
D321	I4	D613	H3	IC302	I4	IC308	H5	IC501	B5	IC507	B5	IC513	G4	IC520	D3
D322	I4	D614	H3	IC303	I4	IC309	H4	IC502	D5	IC508	C4	IC514	G4	IC521	D3
D323	I3	D615	I3	IC304	I4	IC310	H4	IC503	F5	IC509	E5	IC515	G4	IC522	B4

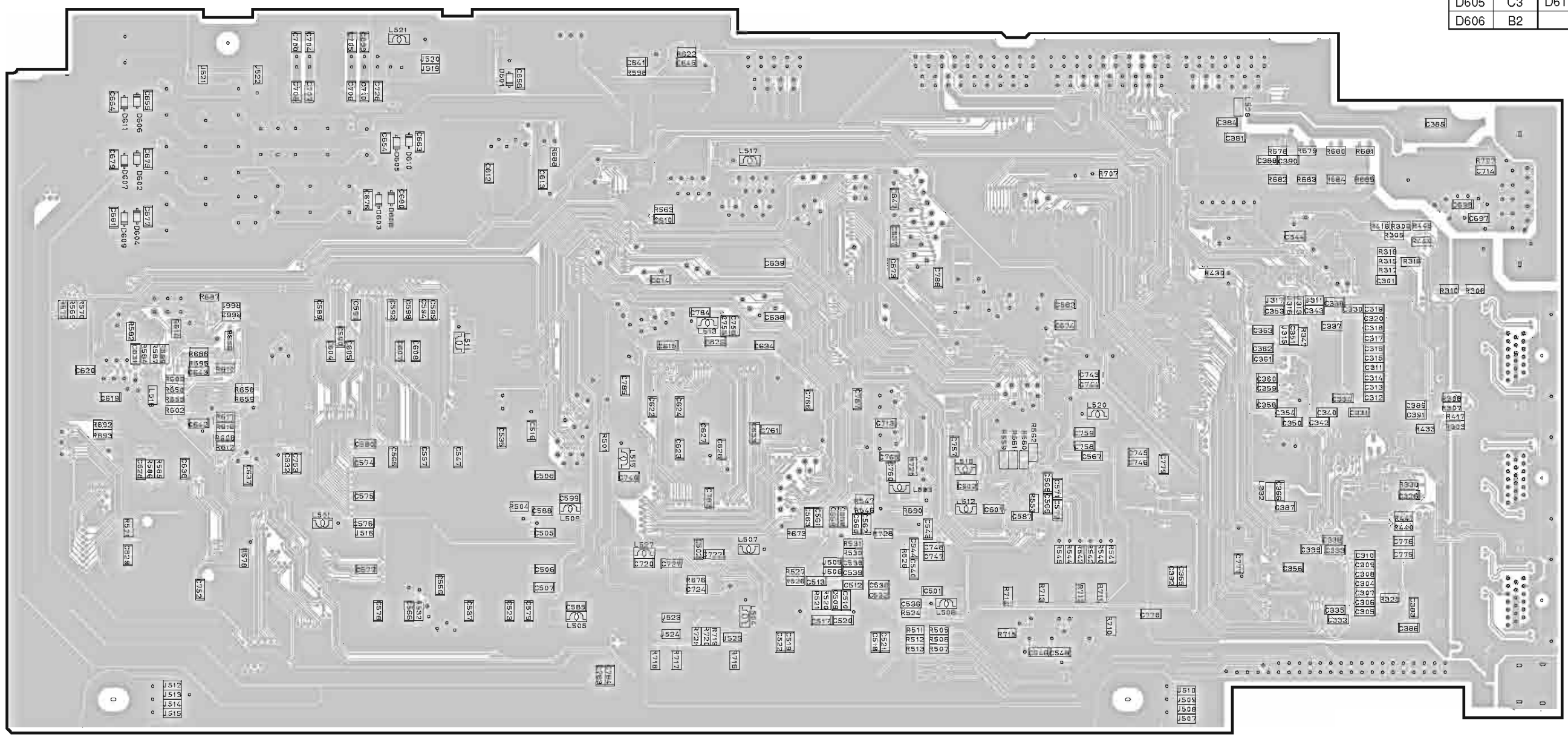
Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
IC523	D4	IC529	I3	IC602	B3	IC608	E5	Q310	H3	Q504	B5				
IC524	G6	IC531	F4	IC603	C3	IC609	F5	Q311	H3	Q505	H3				
IC525	F5	IC532	F5	IC604	B3	IC610	D4	Q410	–	Q506	H3				
IC526	E3	IC533	F4	IC605	C3	Q301	I4	Q501	B4	Q507	H3				
IC527	E3	IC541	E6	IC606	B3	Q302	I4	Q502	B5	Q508	I3				
IC528	B4	IC601	D3	IC607	F5	Q309	I5	Q503	B5						

■ PRINTED CIRCUIT BOARD

D-VIDEO P.C.B. (Side B) Lead Free Solder Used

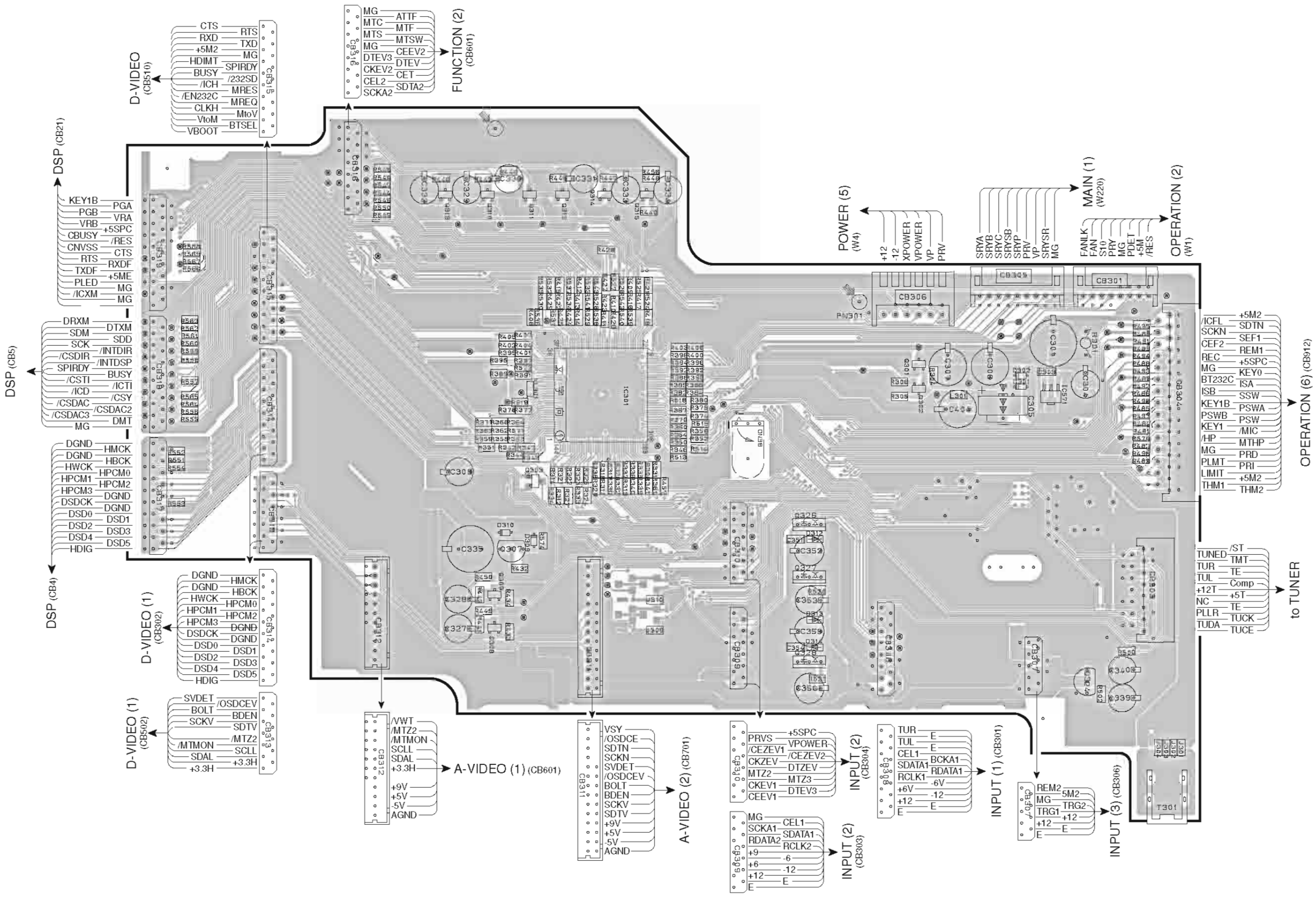
• **Semiconductor Location**

Ref no.	Location	Ref no.	Location
D601	D2	D607	B3
D602	B3	D608	C3
D603	C3	D609	B3
D604	B3	D610	C3
D605	C3	D611	B2
D606	B2		



■ PRINTED CIRCUIT BOARD

FUNCTION (1) P.C.B. (Side A) Lead Free Solder Used

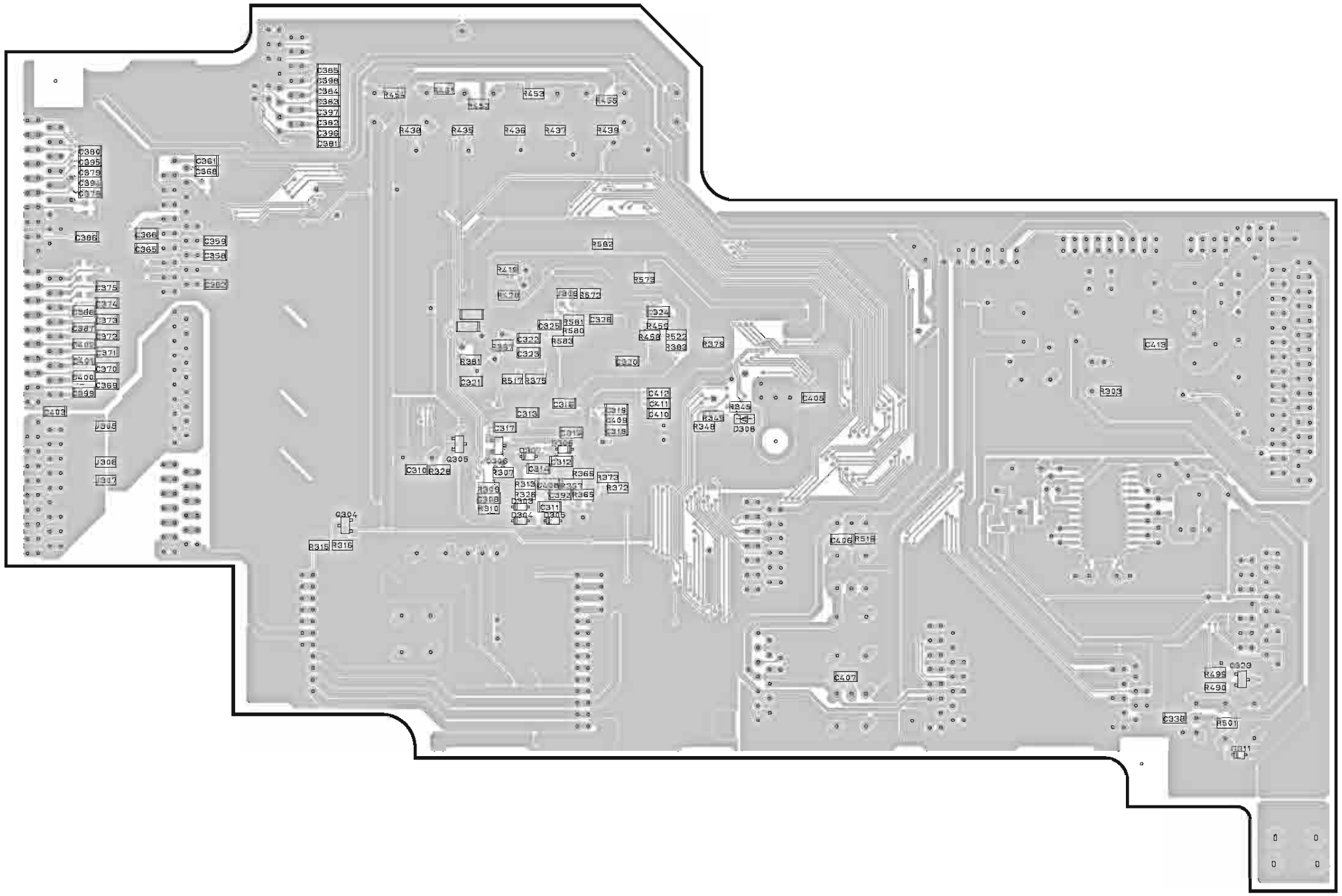


• **Semiconductor Location**

Ref no.	Location	Ref no.	Location
D301	H4	Q308	D5
D302	H4	Q309	D5
D309	D5	Q310	D3
D310	D5	Q311	D3
D312	F5	Q312	E3
D313	F5	Q313	D3
D314	F6	Q314	E3
IC301	E4	Q315	E3
IC571	H4	Q324	H6
Q301	G4	Q326	F5
Q302	G4	Q327	F5
Q303	D4	Q328	F6
Q307	D5		

■ PRINTED CIRCUIT BOARD

FUNCTION (1) P.C.B. (Side B) Lead Free Solder Used

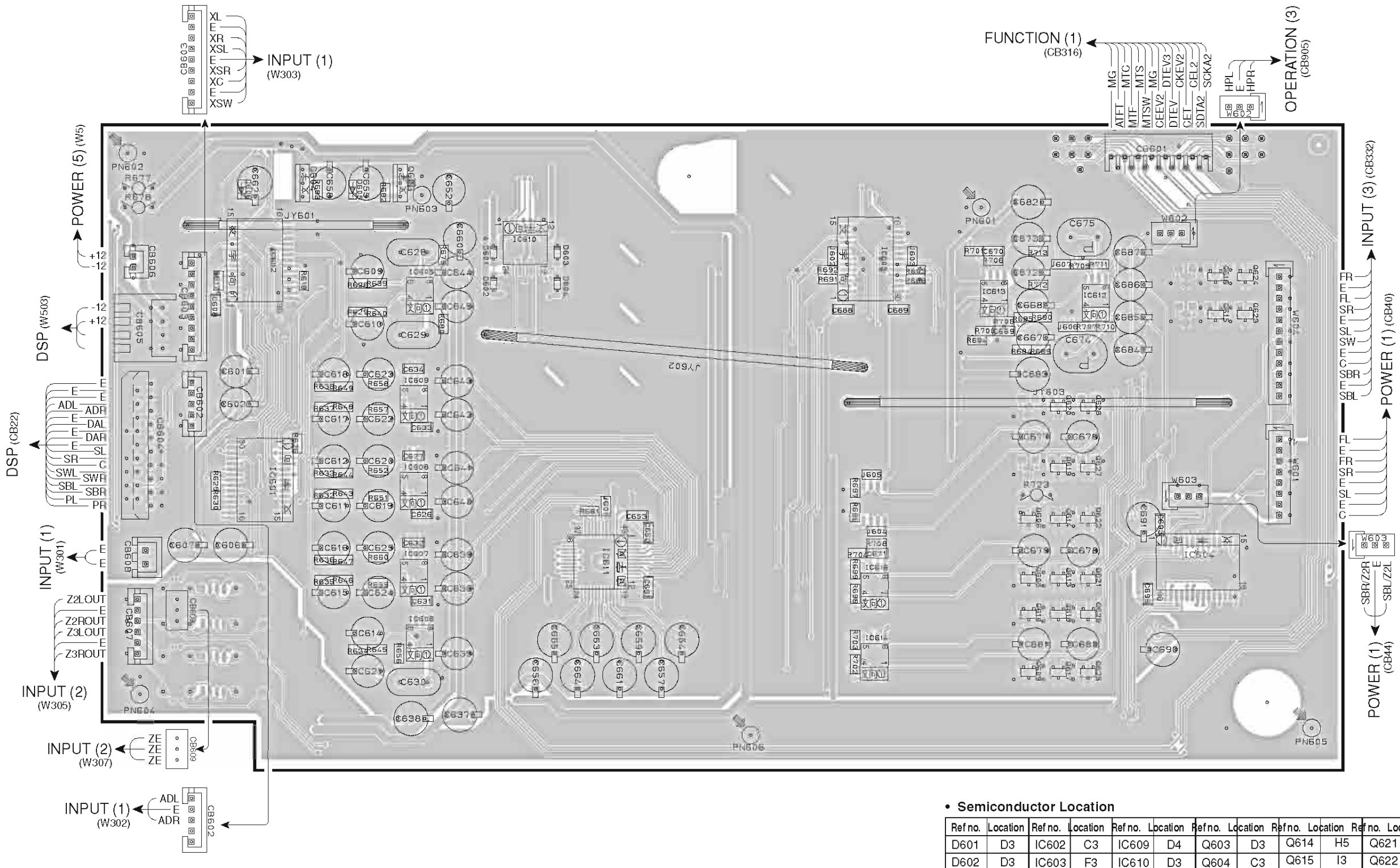


• Semiconductor Location

Ref no.	Location
D303	E5
D304	E5
D305	E5
D306	E4
D307	E4
D308	F4
D311	H6
Q304	D5
Q305	D4
Q306	D4
Q323	H5

■ PRINTED CIRCUIT BOARD

FUNCTION (2) P.C.B. (Side A) Lead Free Solder Used

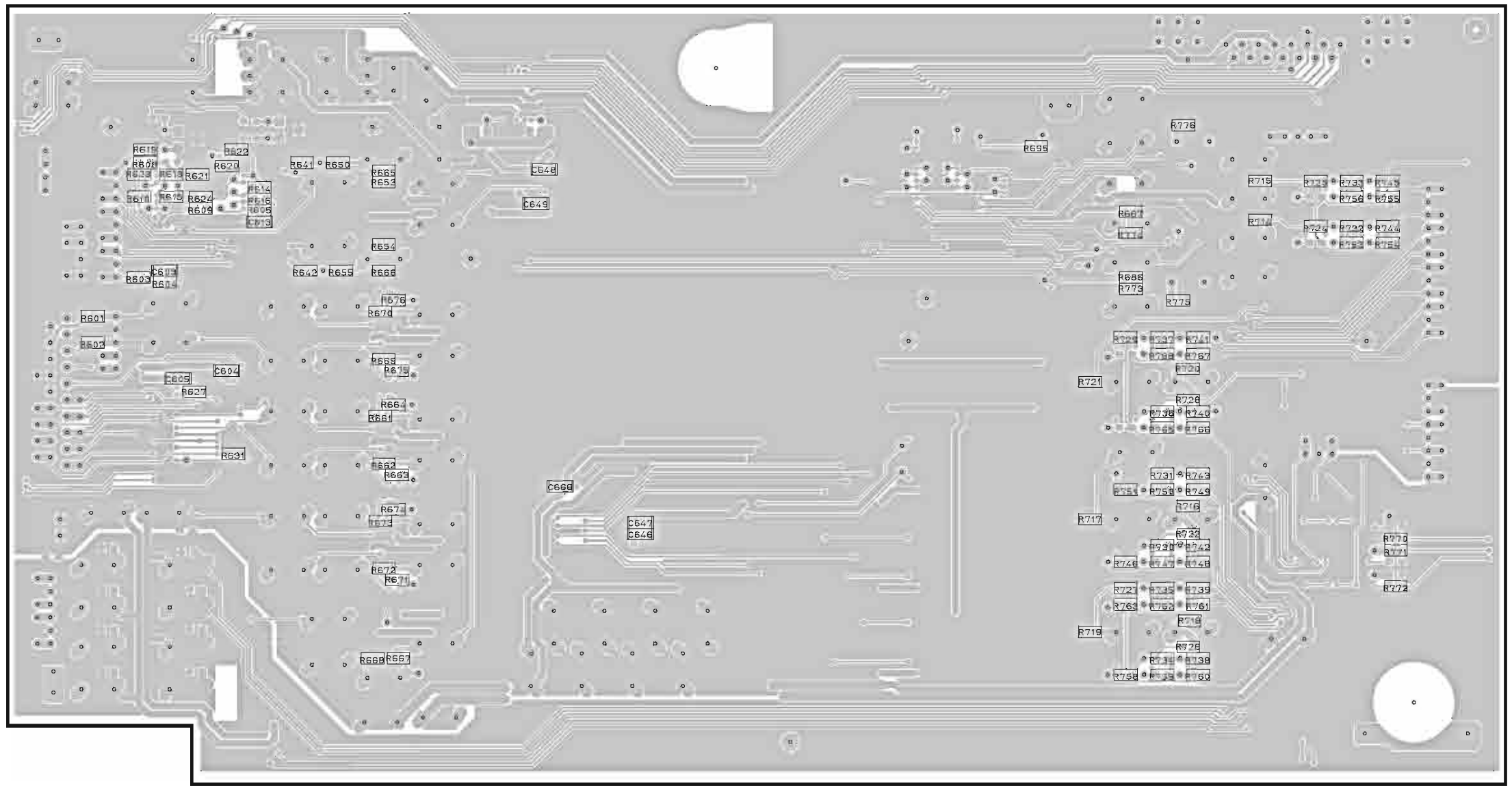


• **Semiconductor Location**

Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
D601	D3	IC602	C3	IC609	D4	Q603	D3	Q614	H5	Q621	H5	Q628	H4
D602	D3	IC603	F3	IC610	D3	Q604	C3	Q615	I3	Q622	H5		
D603	E3	IC604	H5	IC611	E5	Q605	G5	Q616	I3	Q623	I3		
D604	E3	IC605	D3	IC612	H3	Q606	G5	Q617	H6	Q624	I3		
D605	C3	IC606	D5	IC613	G3	Q609	G6	Q618	H5	Q625	H6		
D606	C3	IC607	D5	IC614	G5	Q610	G5	Q619	H4	Q626	H5		
IC601	C4	IC608	D4	IC616	G5	Q613	H5	Q620	H4	Q627	H4		

■ PRINTED CIRCUIT BOARD

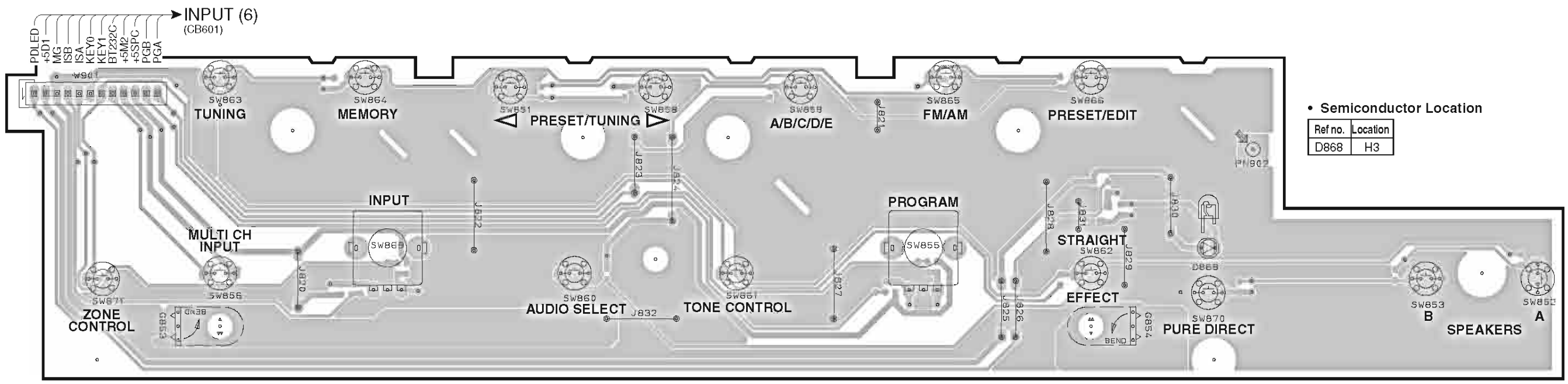
FUNCTION (2) P.C.B. (Side B) Lead Free Solder Used



■ PRINTED CIRCUIT BOARD

OPERATION (1) P.C.B.

(Side A)

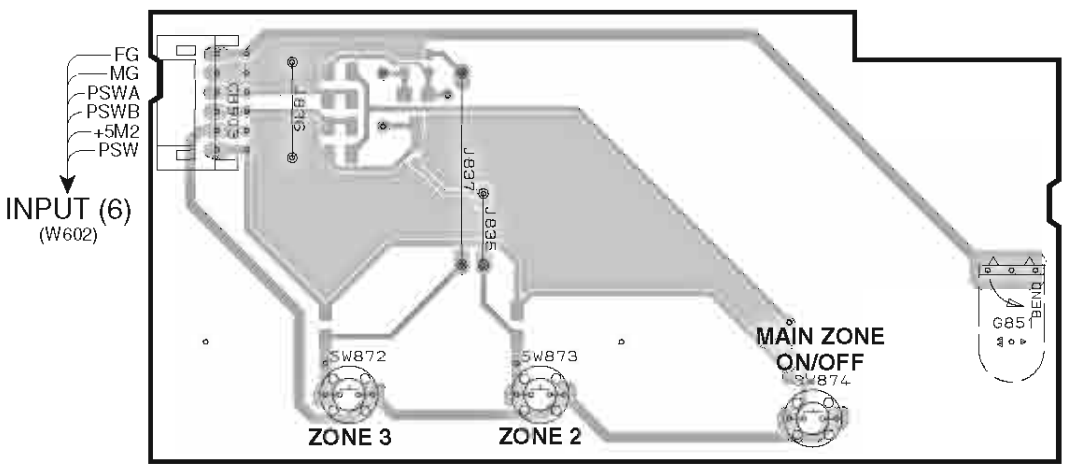


• Semiconductor Location

Ref no.	Location
D868	H3

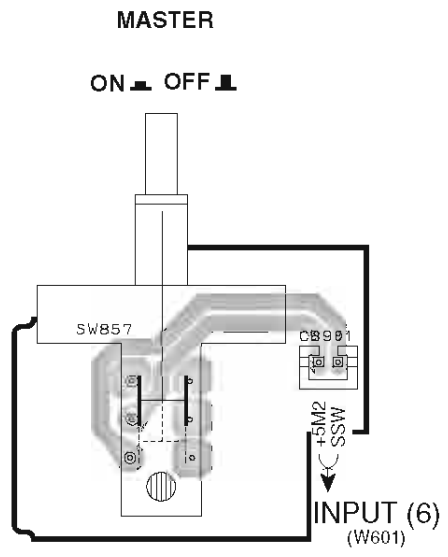
OPERATION (2) P.C.B.

(Side A)



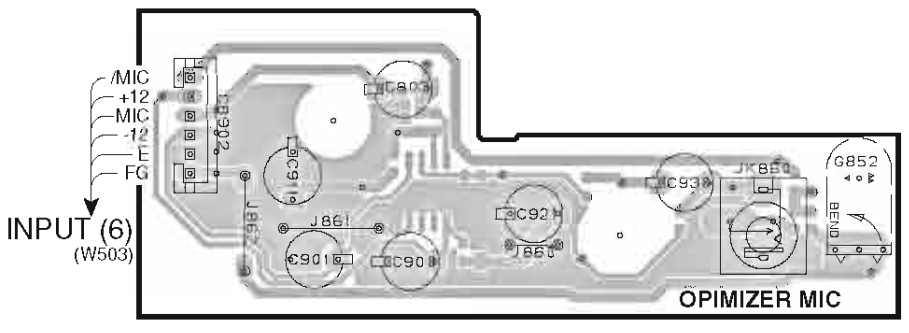
OPERATION (5) P.C.B.

(Side A)



OPERATION (7) P.C.B.

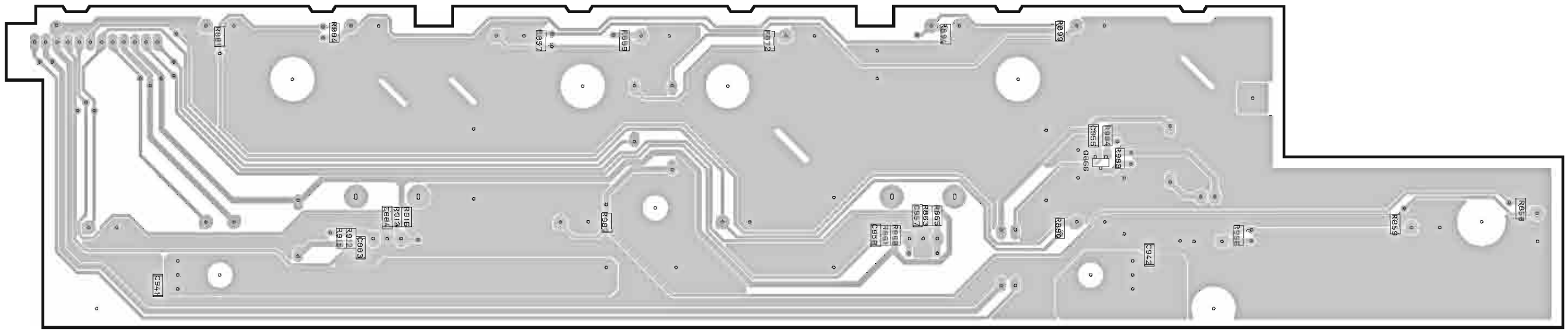
(Side A)



■ PRINTED CIRCUIT BOARD

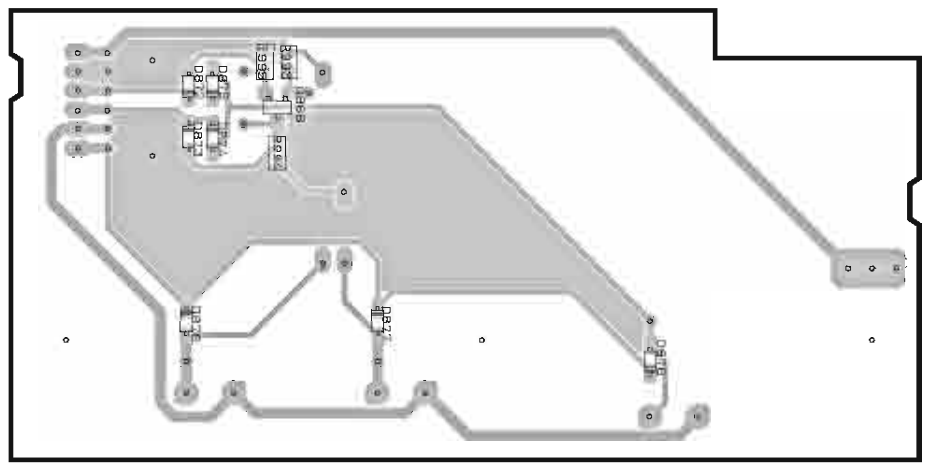
OPERATION (1) P.C.B.

(Side B) Lead Free Solder Used



OPERATION (2) P.C.B.

(Side B) Lead Free Solder Used

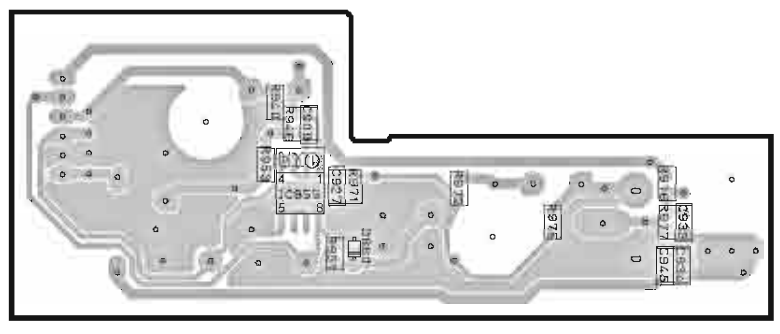


• **Semiconductor Location**

Ref no.	Location	Ref no.	Location
D860	H6	D877	C6
D872	B6	D878	B6
D873	B6	IC855	H6
D874	B6	Q866	G3
D875	B6	Q868	B6
D876	D7		

OPERATION (7) P.C.B.

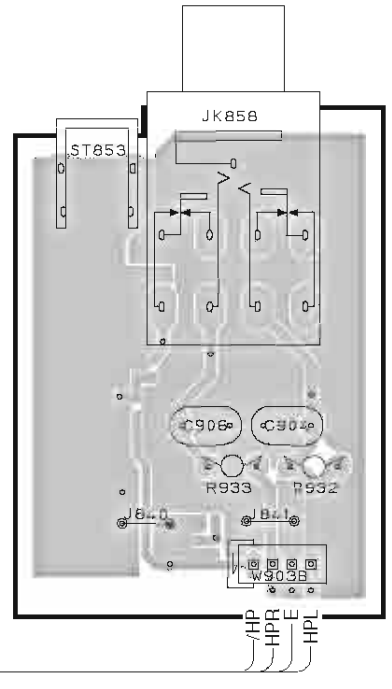
(Side B) Lead Free Solder Used



■ PRINTED CIRCUIT BOARD

OPERATION (4) P.C.B.
(Side A)

SILENT CINEMA
PHONES

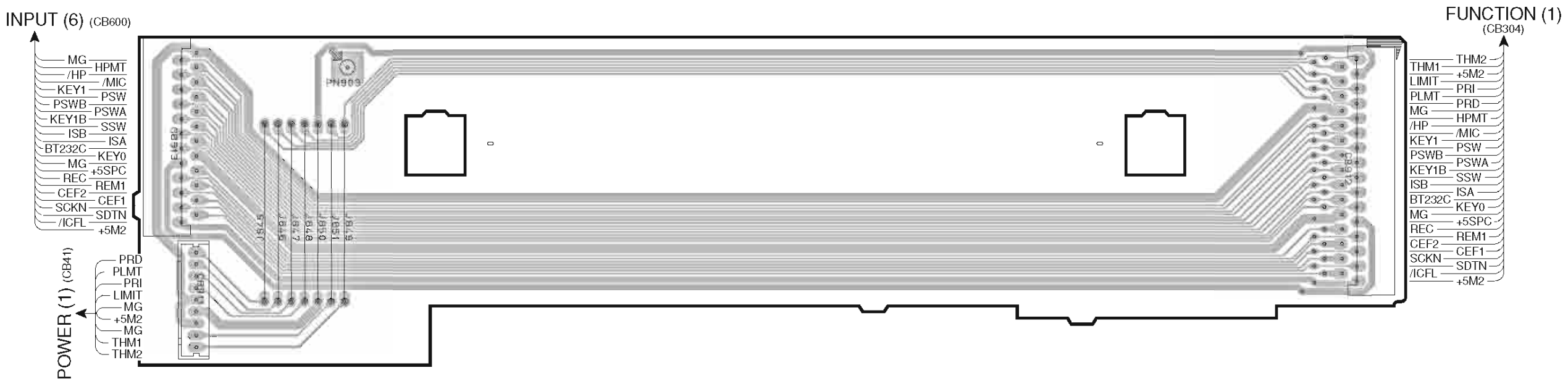


• Semiconductor Location

Ref no.	Location
D861	F4
D862	E4

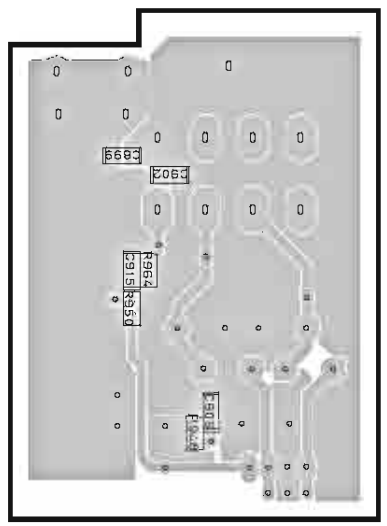
OPERATION (3) P.C.B.
(Side A)

OPERATION (6) P.C.B. (Side A)

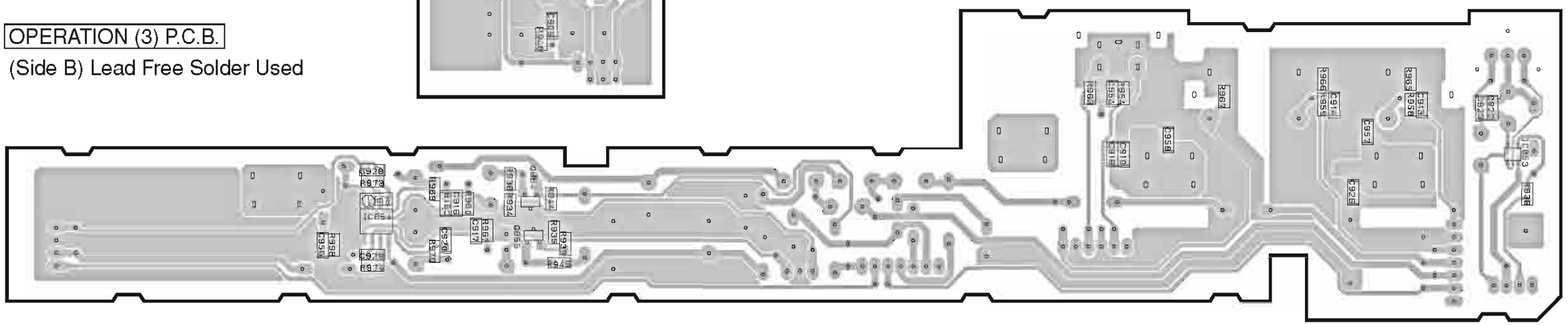


■ PRINTED CIRCUIT BOARD

OPERATION (4) P.C.B.
(Side B) Lead Free Solder Used



OPERATION (3) P.C.B.
(Side B) Lead Free Solder Used

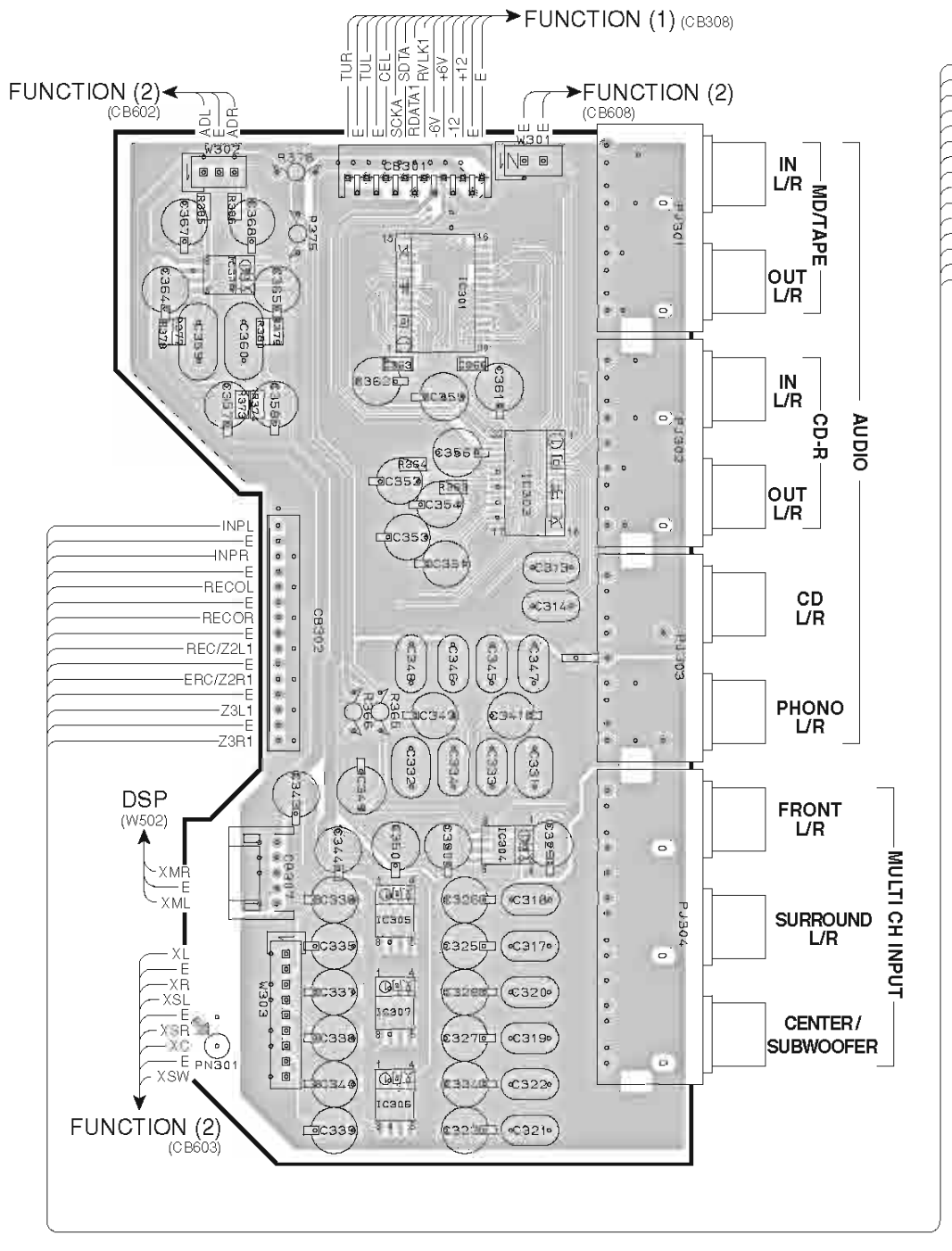


- **Semiconductor Location**

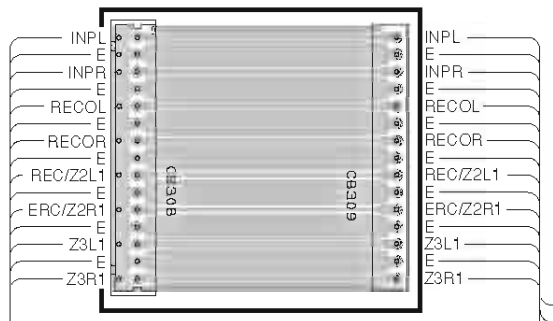
Ref no.	Location
IC853	I4
IC854	C4
Q864	D4
Q865	D4

■ PRINTED CIRCUIT BOARD

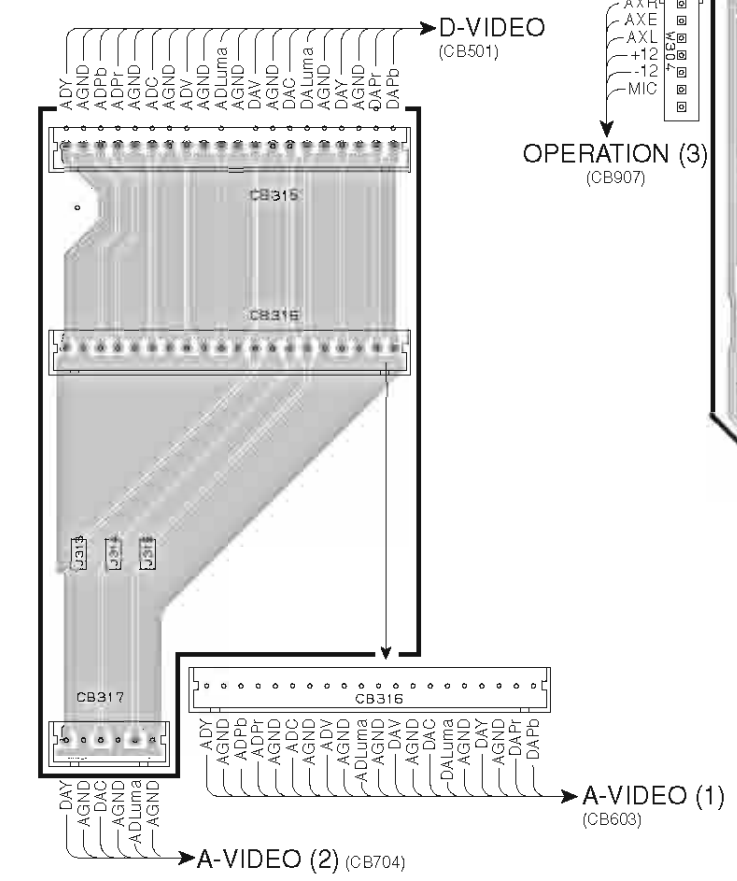
INPUT (1) P.C.B. (Side A) Lead Free Solder Used



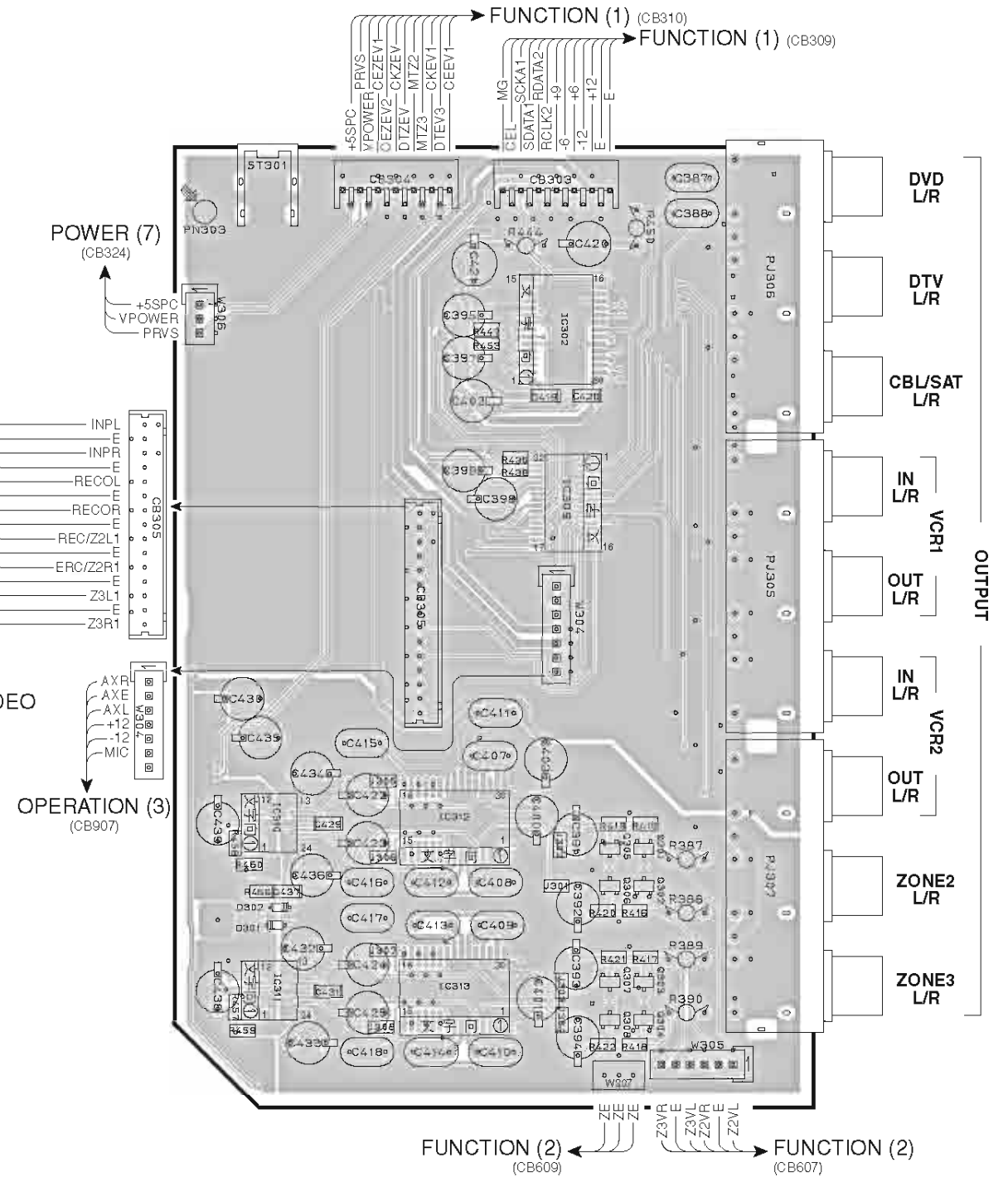
INPUT (4) P.C.B. (Side A)
Lead Free Solder Used



INPUT (5) P.C.B. (Side A)
Lead Free Solder Used



INPUT (2) P.C.B. (Side A) Lead Free Solder Used

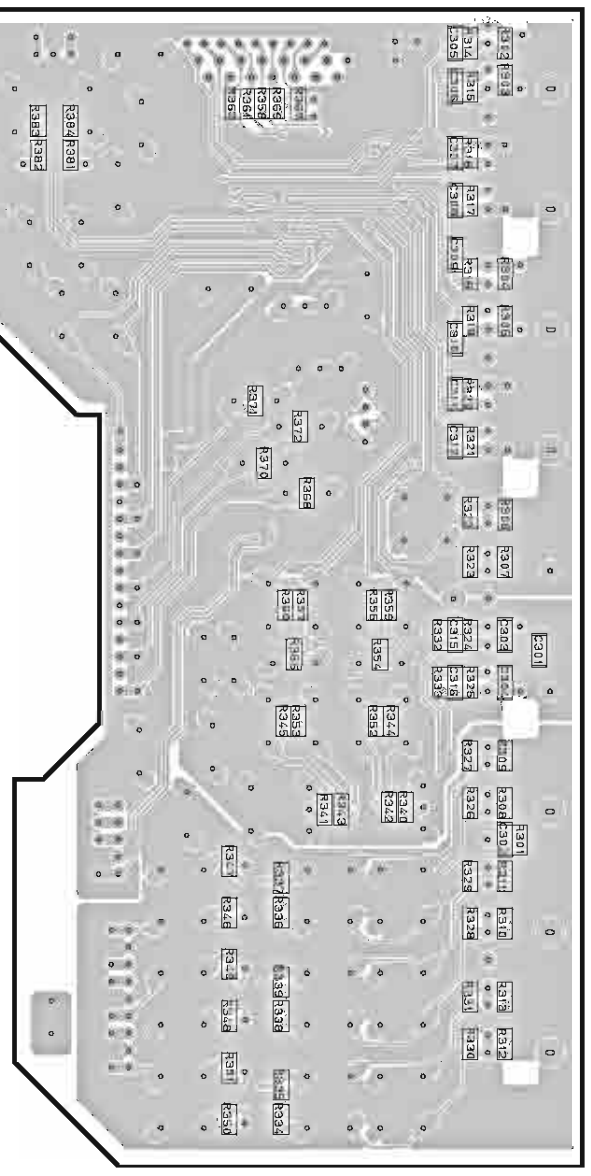


• **Semiconductor Location**

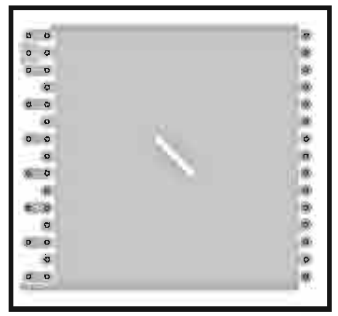
Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
D301	G5	IC303	C4	IC307	B6	IC311	G5	Q302	I5	Q306	I5
D302	G5	IC304	C5	IC308	B3	IC312	H5	Q303	I5	Q307	I5
IC301	B3	IC305	B5	IC309	I3	IC313	H5	Q304	I5	Q308	I5
IC302	I3	IC306	B6	IC310	G5	Q301	I5	Q305	I5		

■ PRINTED CIRCUIT BOARD

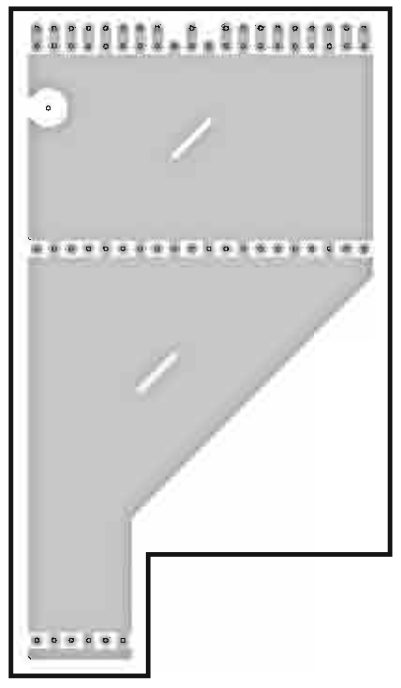
INPUT (1) P.C.B. (Side B) Lead Free Solder Used



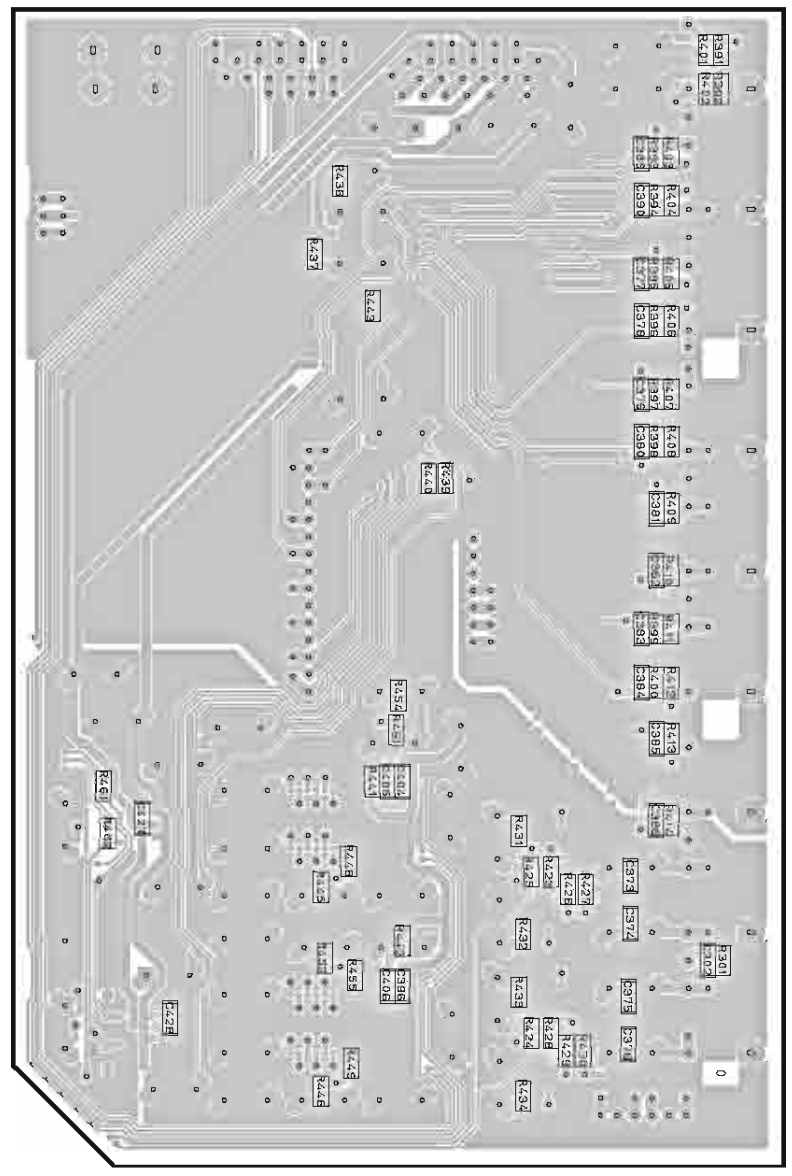
INPUT (4) P.C.B. (Side B)
Lead Free Solder Used



INPUT (5) P.C.B. (Side B)
Lead Free Solder Used

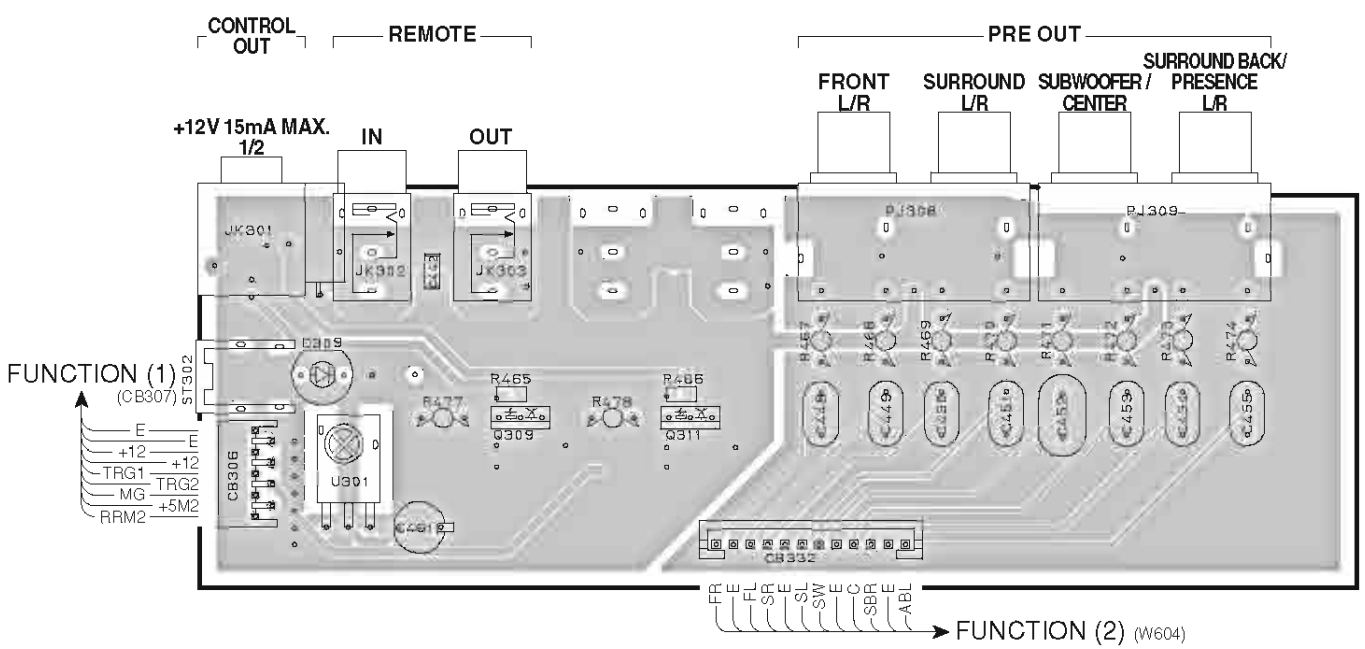


INPUT (2) P.C.B. (Side B) Lead Free Solder Used



■ PRINTED CIRCUIT BOARD

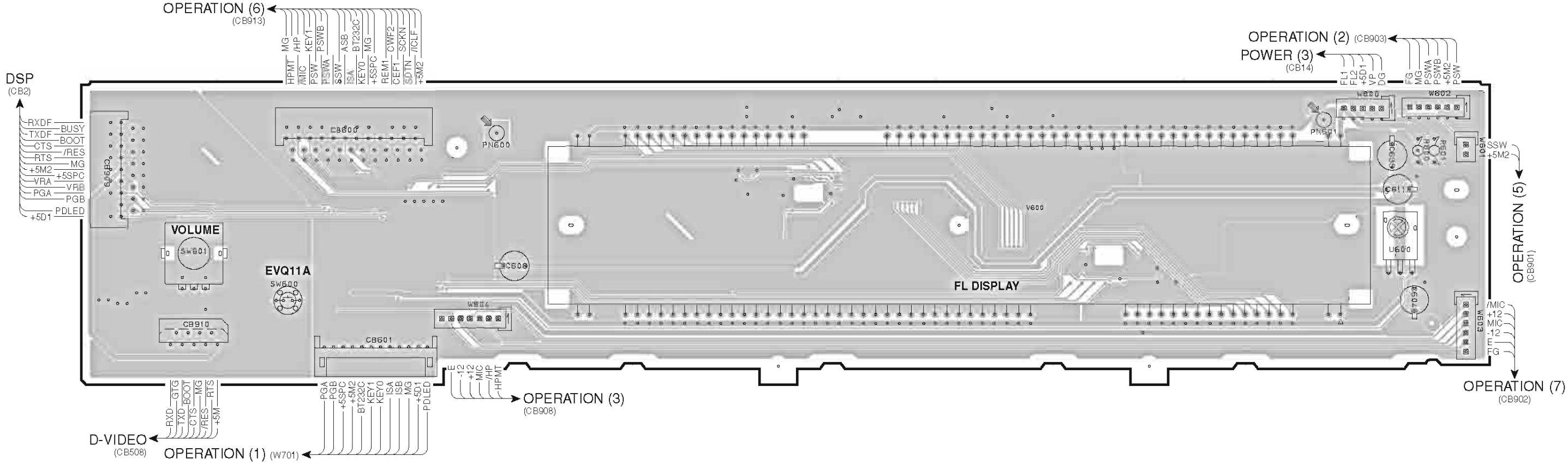
INPUT (3) P.C.B. (Side A) Lead Free Solder Used



- **Semiconductor Location**

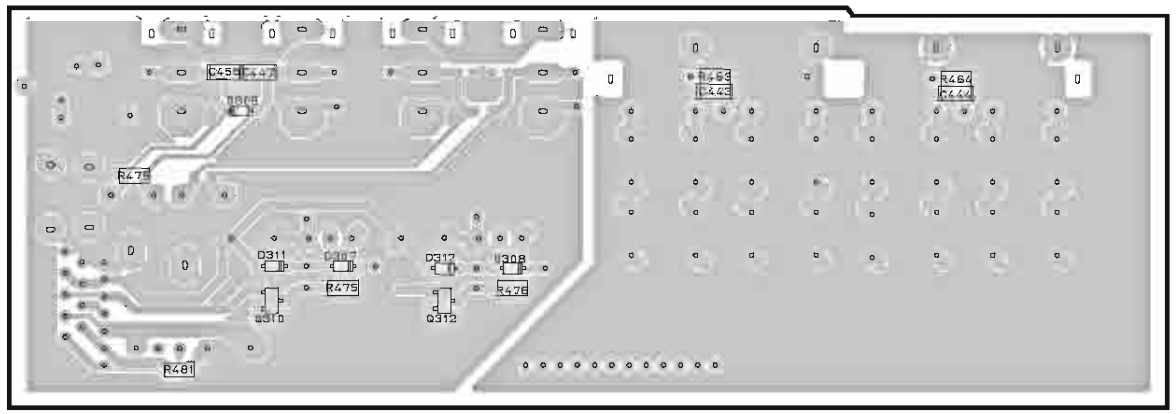
Ref no.	Location
D309	D3
Q309	E3
Q311	E3

INPUT (6) P.C.B. (Side A) Lead Free Solder Used

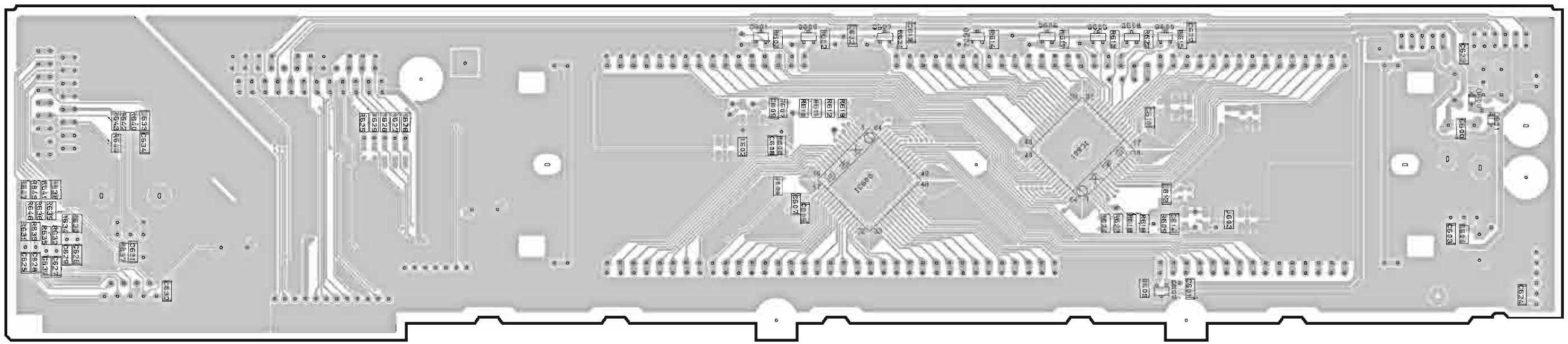


■ PRINTED CIRCUIT BOARD

INPUT (3) P.C.B. (Side B) Lead Free Solder Used



INPUT (6) P.C.B. (Side B) Lead Free Solder Used

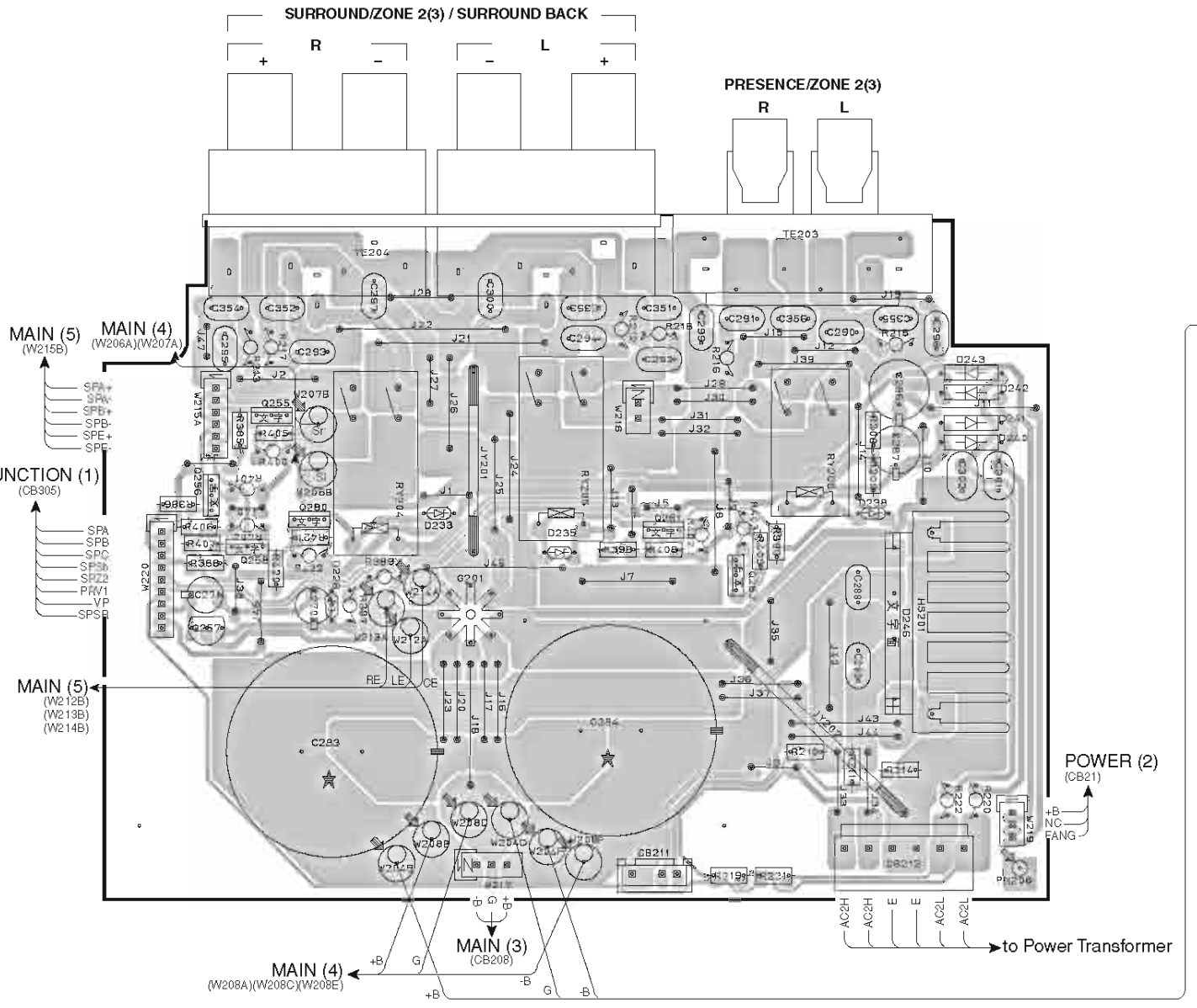


- **Semiconductor Location**

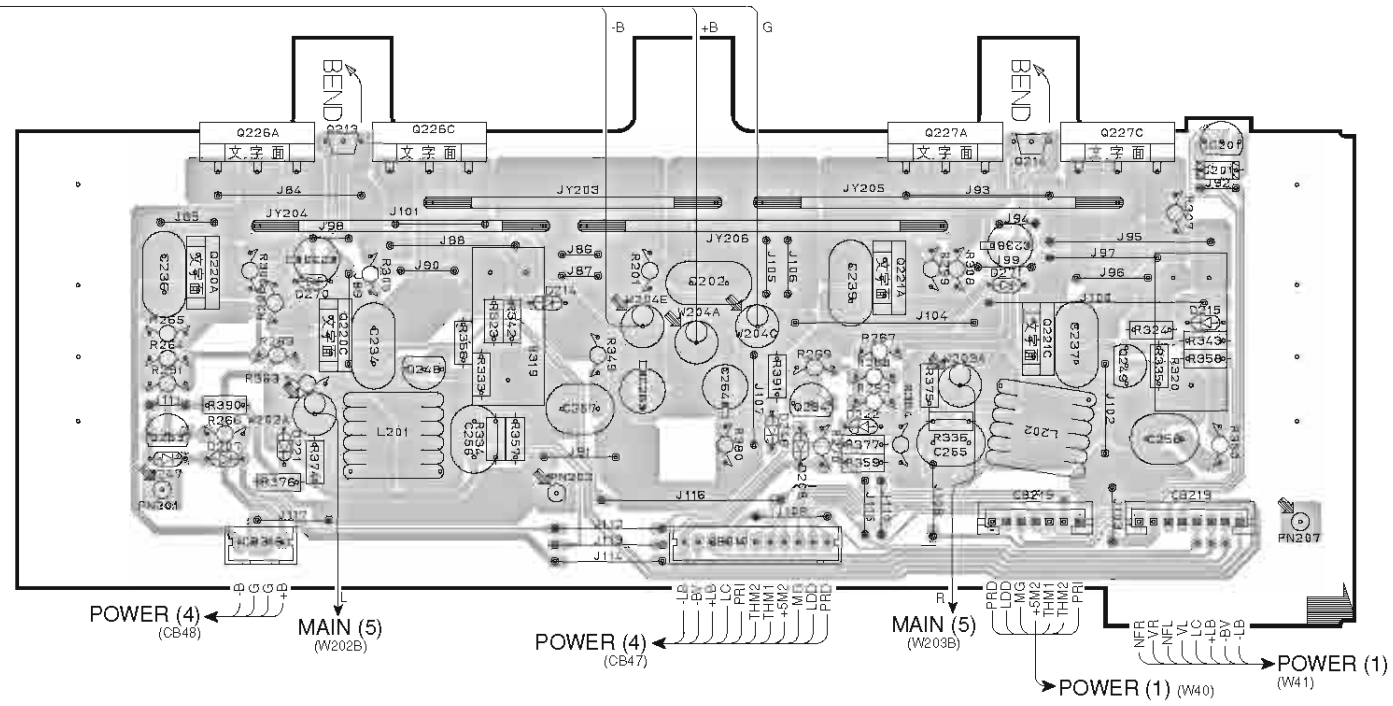
Ref no.	Location	Ref no.	Location	Ref no.	Location
D305	E2	IC600	F5	Q603	H5
D307	E3	IC601	G5	Q604	G5
D308	F3	Q310	E3	Q605	H5
D311	E3	Q312	E3	Q606	G5
D312	E3	Q600	F5	Q607	F5
D600	J5	Q601	E5	Q608	H5
D601	J5	Q602	H6		

■ PRINTED CIRCUIT BOARD Lead Free Solder Used

MAIN (1) P.C.B. (Side A)



MAIN (2) P.C.B. (Side A)

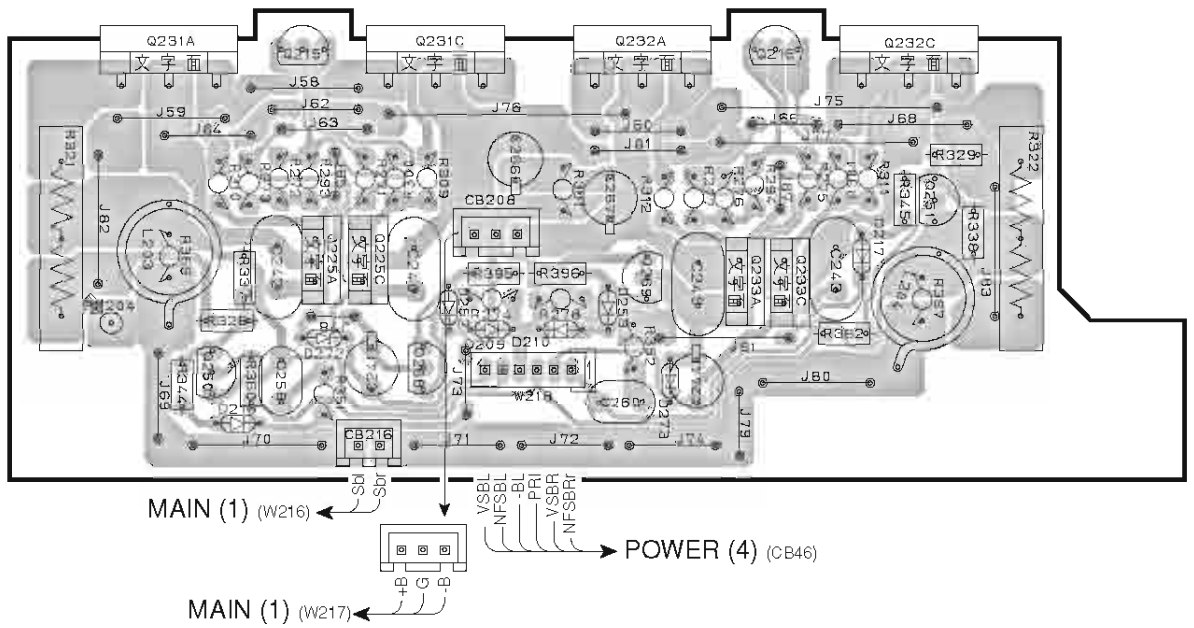


• **Semiconductor Location**

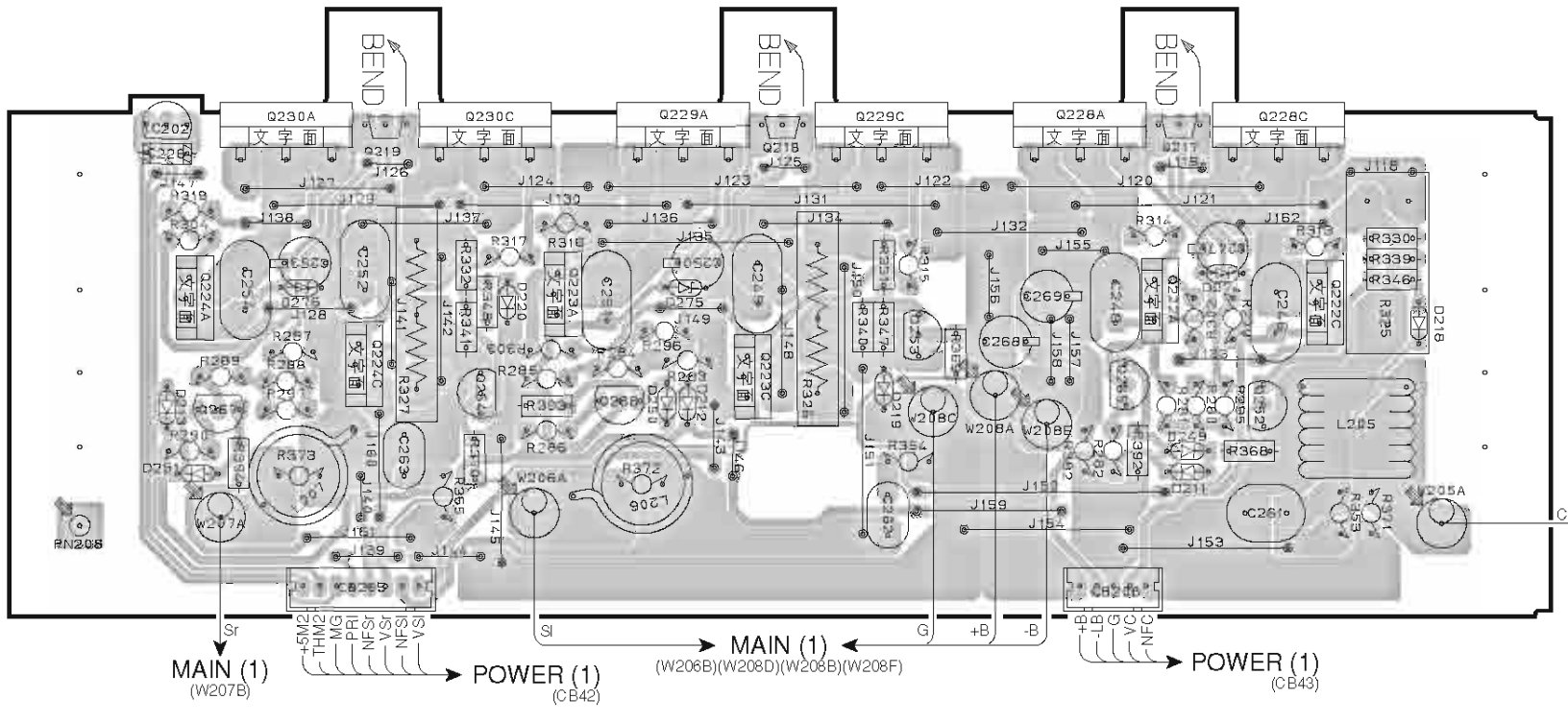
Ref no.	Location	Ref no.	Location	Ref no.	Location
D207	G4	D243	E3	Q226A	G3
D208	I4	D246	E3	Q226C	G3
D214	H4	D247	F4	Q227A	I3
D215	J4	D248	H4	Q227C	J3
D221	G4	D270	G4	Q255	B3
D222	I4	D271	I4	Q256	B3
D228	B4	IC201	J3	Q257	B4
D233	C4	Q213	G3	Q258	B4
D235	C4	Q214	I3	Q261	D4
D238	E4	Q220A	G4	Q262	D4
D240	E3	Q220C	G4	Q263	F4
D241	E3	Q221A	I4	Q264	I4
D242	E3	Q221C	I4	Q280	B4

■ PRINTED CIRCUIT BOARD Lead Free Solder Used

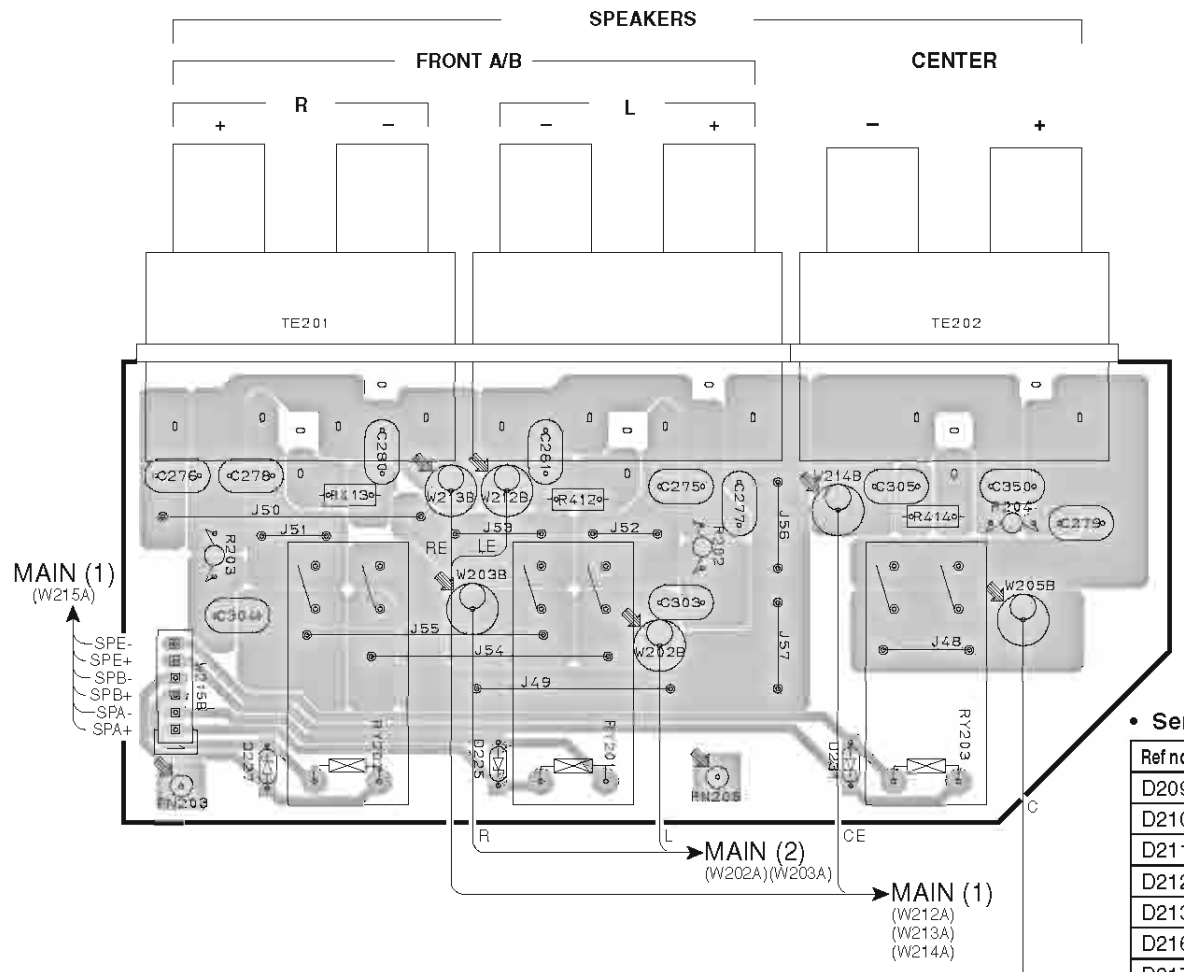
MAIN (3) P.C.B. (Side A)



MAIN (4) P.C.B. (Side A)



MAIN (5) P.C.B. (Side A)

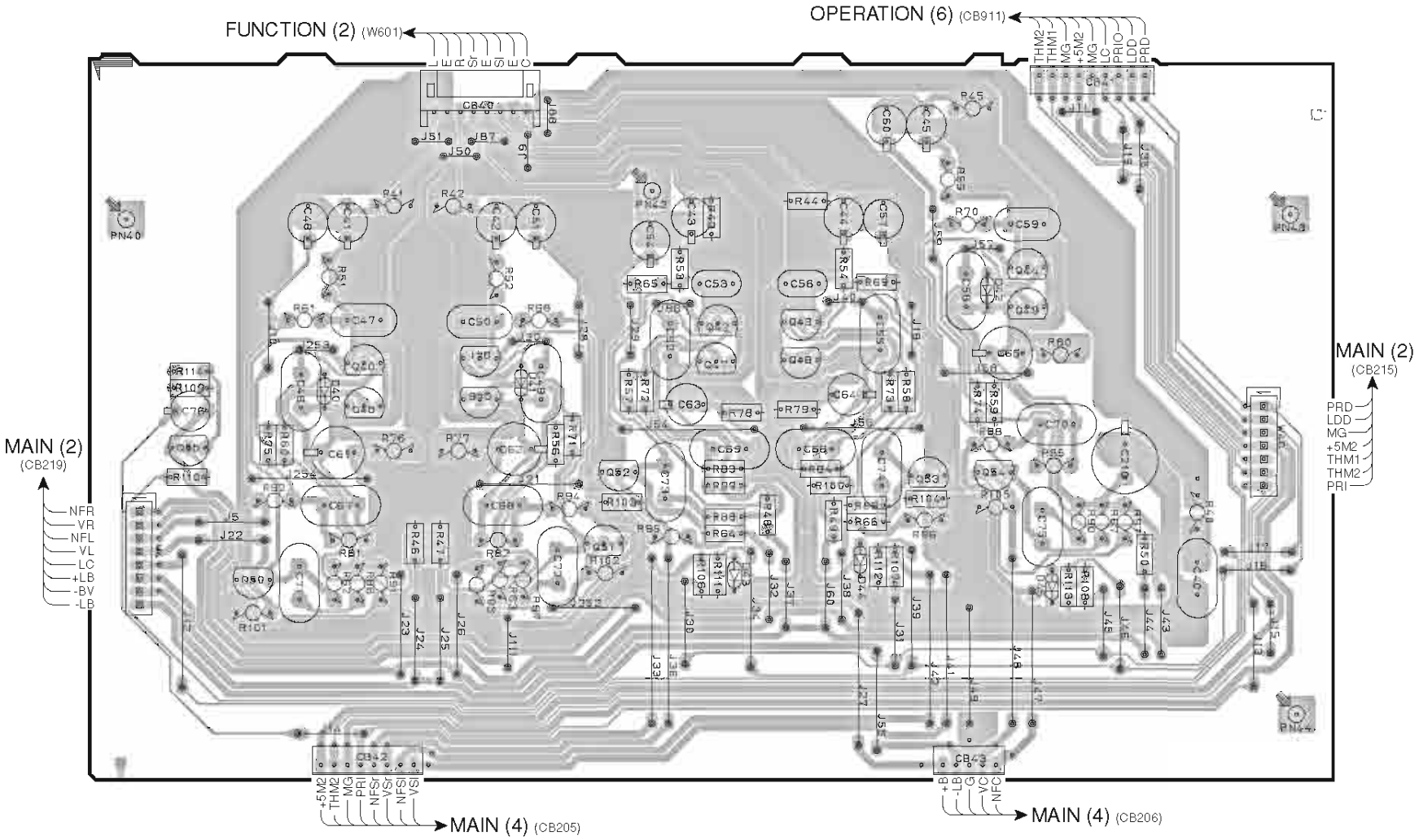


• Semiconductor Location

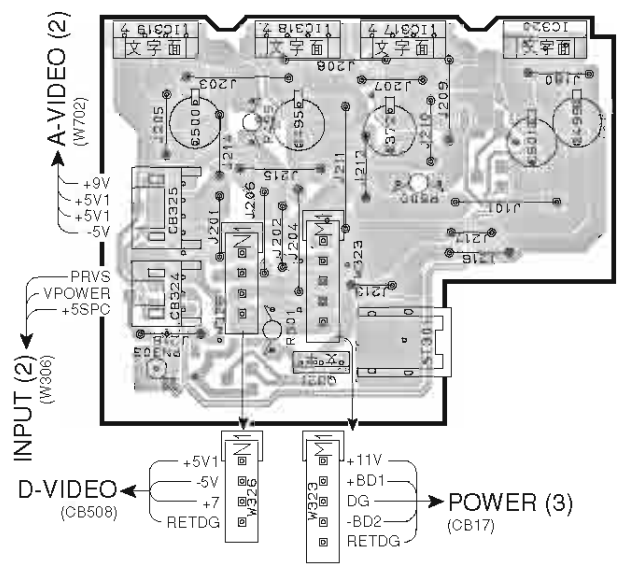
Ref no.	Location	Ref no.	Location
D209	B3	Q223A	C3
D210	C3	Q223C	C3
D211	E6	Q224A	A5
D212	C6	Q224C	B6
D213	B6	Q225A	B2
D216	B3	Q225C	B2
D217	D2	Q228A	E5
D218	F5	Q228C	E5
D219	D6	Q229A	C5
D220	C5	Q229C	D5
D225	G4	Q230A	B5
D227	F4	Q230C	C5
D231	H4	Q231A	A2
D249	E6	Q231C	B2
D250	C6	Q232A	C2
D251	A6	Q232C	D2
D252	B3	Q233A	C5
D253	C3	Q233C	D5
D272	B3	Q248	–
D273	C3	Q249	–
D274	E5	Q250	B3
D275	C5	Q251	D2
D276	B5	Q252	E6
IC202	A5	Q253	D5
Q215	B2	Q254	C6
Q216	C2	Q265	E6
Q217	E5	Q266	C6
Q218	D5	Q267	B6
Q219	B5	Q268	B3
Q222A	E5	Q269	C3
Q222C	E5		

■ PRINTED CIRCUIT BOARD

POWER (1) P.C.B. (Side A)



POWER (7) P.C.B. (Side A)



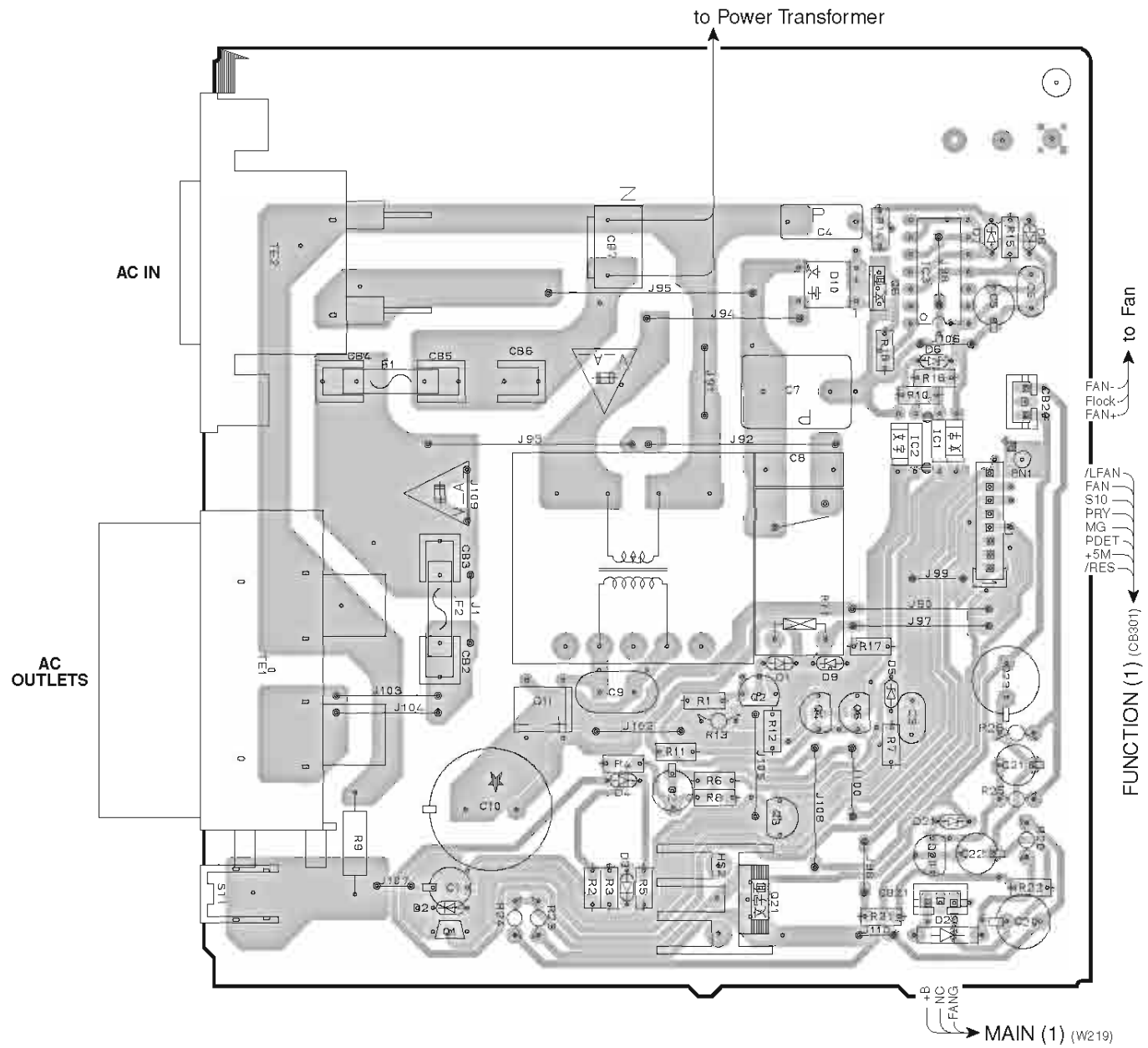
POWER (7) P.C.B. (Side B) Lead Free Solder Used

- **Semiconductor Location**

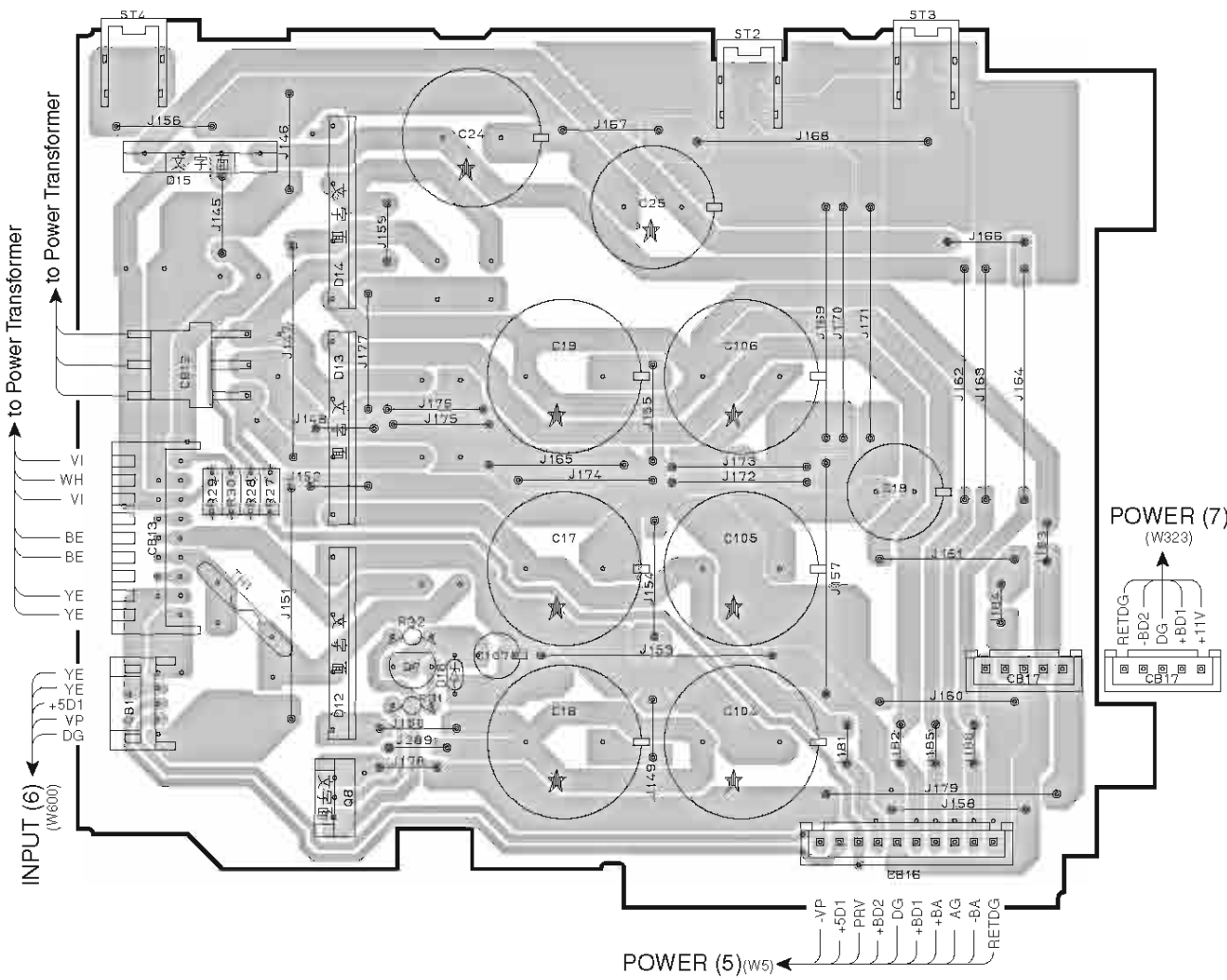
Ref no.	Location
D40	B3
D41	C3
D42	E3
D43	D4
D44	D4
D45	E4
D323	H6
IC317	E5
IC318	E5
IC319	E5
IC320	F5
Q40	B3
Q41	C3
Q42	D3
Q43	D3
Q44	E3
Q45	B3
Q46	C3
Q47	D3
Q48	D3
Q49	E3
Q50	B4
Q51	C4
Q52	C3
Q53	E3
Q54	E3
Q55	B3
Q319	G6
Q320	G7
Q321	E6
Q323	H6

■ PRINTED CIRCUIT BOARD

POWER (2) P.C.B. (Side A)



POWER (3) P.C.B. (Side A)

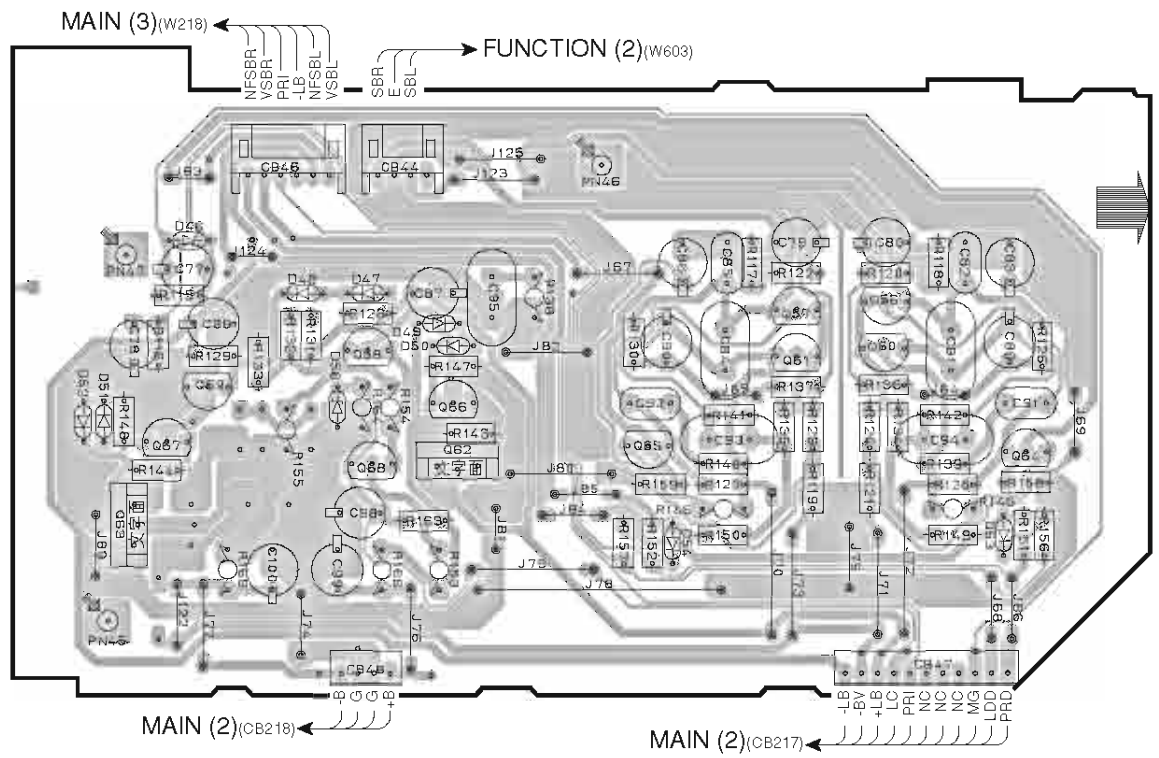


- **Semiconductor Location**

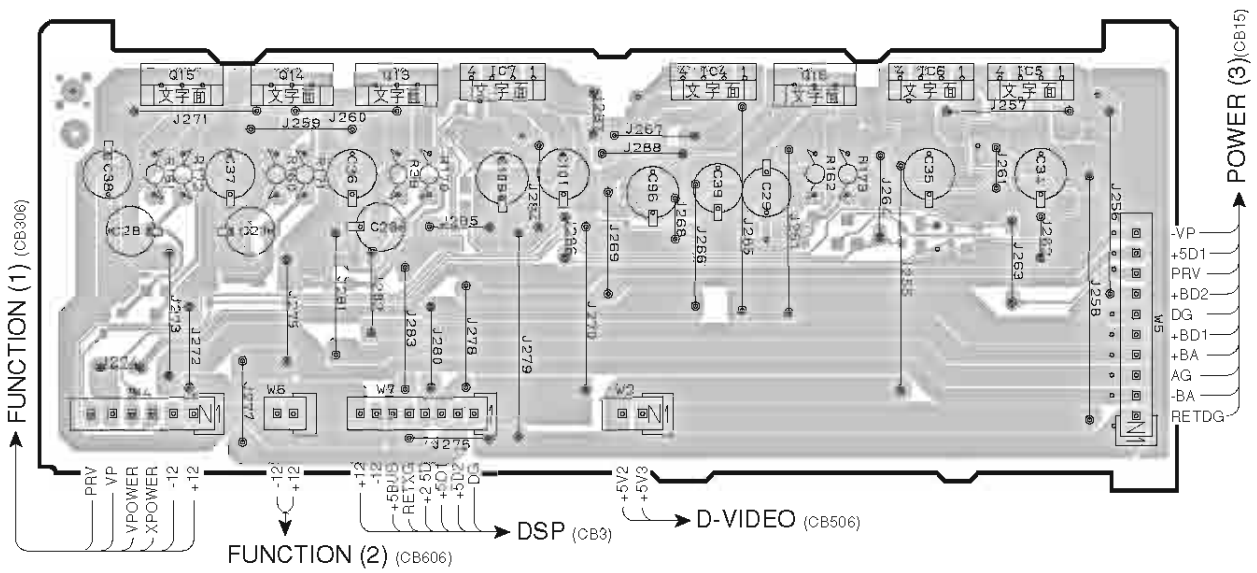
Ref no.	Location	Ref no.	Location	Ref no.	Location
D1	D4	D12	G4	Q2	D4
D2	C5	D13	G3	Q3	D5
D3	C5	D14	G3	Q4	D5
D4	C5	D15	F2	Q5	D5
D5	D4	D16	G4	Q6	D3
D6	D3	D20	D5	Q7	G4
D7	E3	D21	E5	Q8	G5
D8	E3	IC1	E3	Q20	D5
D9	D4	IC2	D3	Q21	D5
D10	D3	IC3	D3		
D11	C5	Q1	C5		

■ PRINTED CIRCUIT BOARD

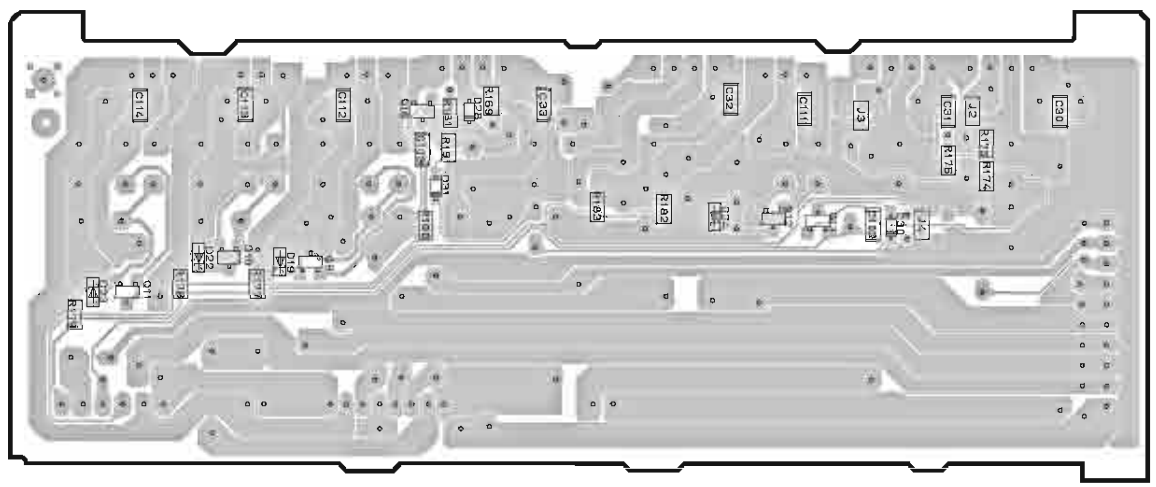
POWER (4) P.C.B. (Side A)



POWER (5) P.C.B. (Side A)



POWER (5) P.C.B. (Side B) Lead Free Solder Used

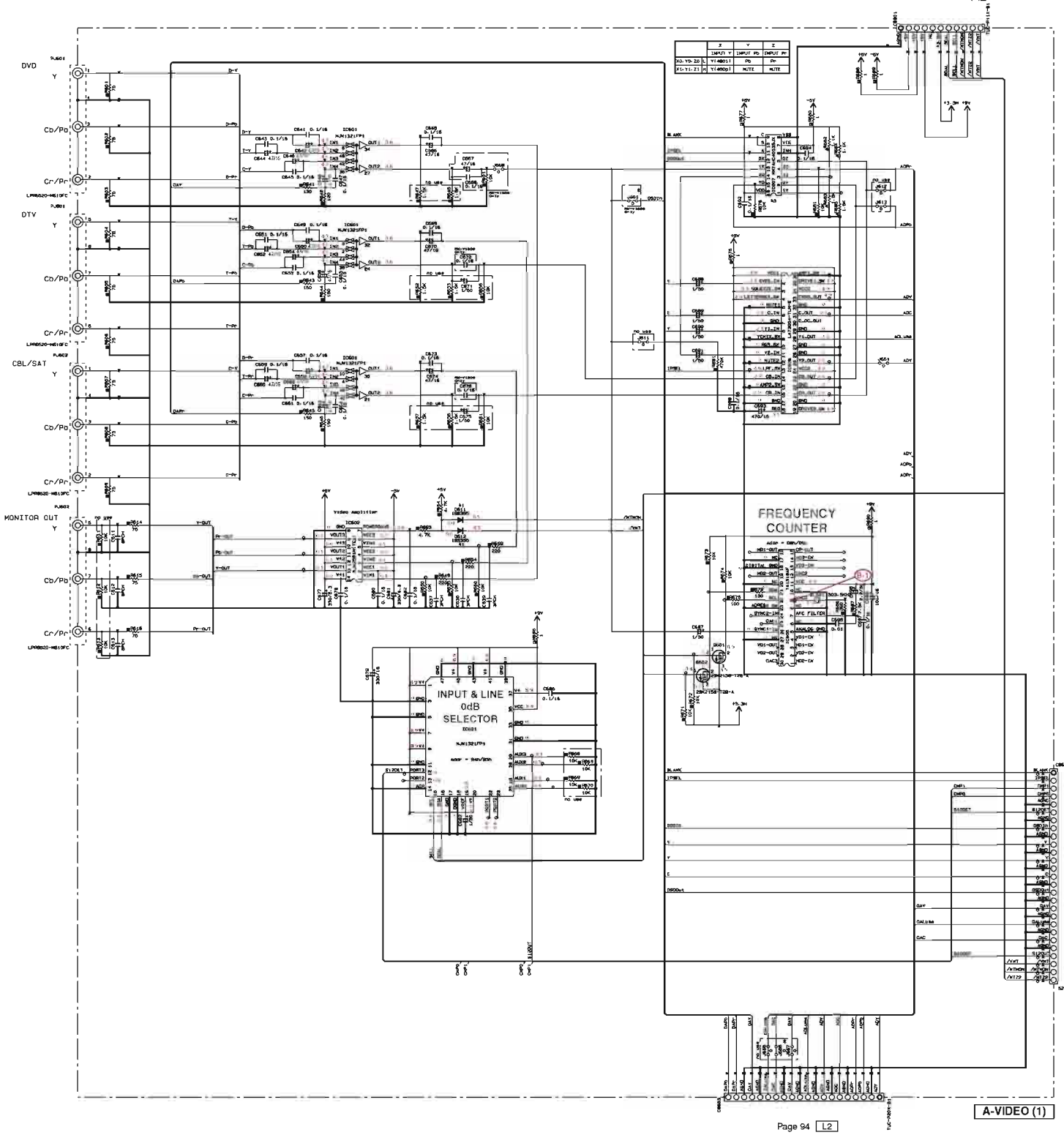


- **Semiconductor Location**

Ref no.	Location	Ref no.	Location
D19	G5	Q11	F5
D22	F5	Q12	H5
D23	F5	Q13	G2
D24	H5	Q14	G2
D28	G5	Q15	F2
D30	I5	Q16	H2
D31	G5	Q17	H5
D46	B2	Q18	G5
D47	B3	Q56	D3
D48	B3	Q57	D3
D49	C3	Q58	B3
D50	C3	Q59	B3
D51	A3	Q60	D3
D52	A3	Q61	D3
D53	E3	Q62	C3
D56	B3	Q63	B3
IC4	H2	Q64	E3
IC5	I2	Q65	C3
IC6	I2	Q66	C3
IC7	G2	Q67	B3
Q9	G5	Q68	B3
Q10	F5		

■ SCHEMATIC DIAGRAM (A-VIDEO 1/2)

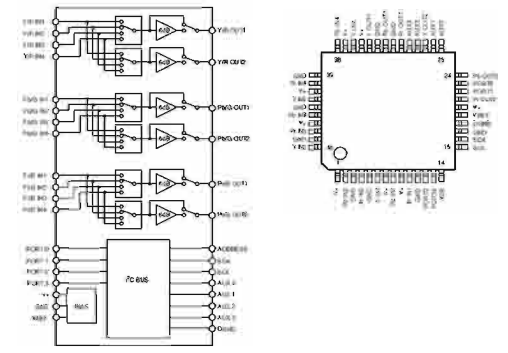
Page 89 H2
to FUNCTION (1)_CB312



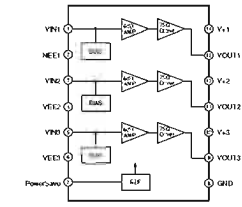
Page 94 L2
to INPUT (5)_CB316

Page 97 G9
to A-VIDEO (2)_CB703

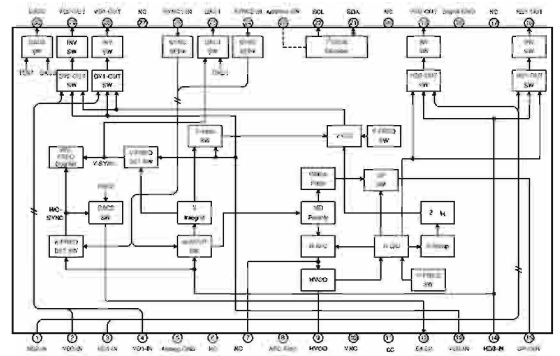
IC601: NJW1321FP1
Wide Band Video Switch with I²C BUS



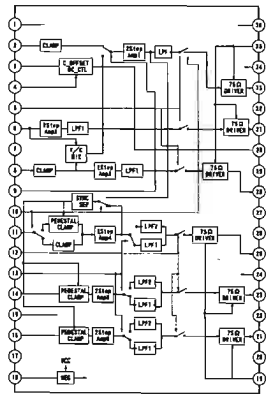
IC602: NJM2581M
Video Amp



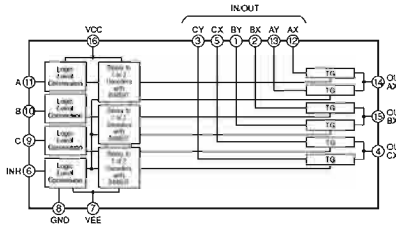
IC605: TA1318AF
SYNC Processor, Frequency Counter IC for TV Component Signals



IC606: LA73054-TLM-E
Analog Amp



IC607: MM74HC4053SJX
Triple 2-Channel Analog Multiplexer



POINT (B-3) Pin 9 of IC605

★ All voltages are measured with a 10MΩ/V DC electronic volt meter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

■ SCHEMATIC DIAGRAM (A-VIDEO 2/2)

Page 91 J3
to OPERATION (3)_CB906

Page 89 G2
to FUNCTION (1)_CB311

Page 93 I2
to POWER (7)_CB325

SIGNAL DETECT

CLAMP

OSD IC

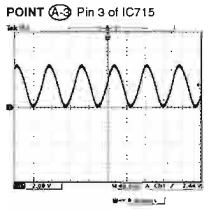
ANALOG Bypass

A-VIDEO (2)

Page 94 L2
to INPUT (5)_CB317

Page 96 H7
to A-VIDEO (1)_CB602

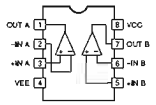
POINT A-3 Pin 3 of IC715



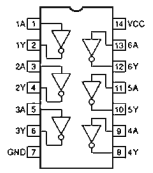
IC709: LA73050-TLM-E
Analog Amp

IC710: LA7104M
Video Amp

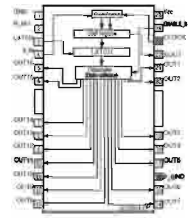
IC712: TK15420M
Video Amp



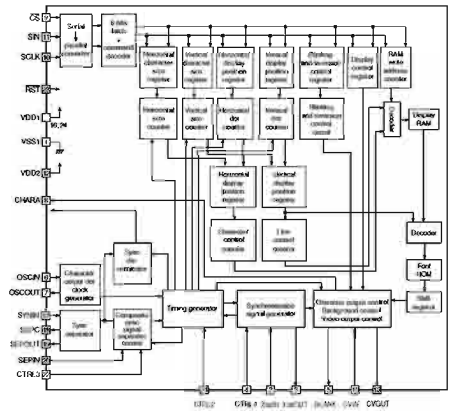
IC713: TC74HCU04AFEL
Hex Inverters



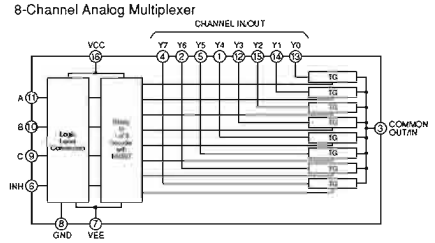
IC714: BD7851FP-E2
LED driver IC with built-in 16bit shift register



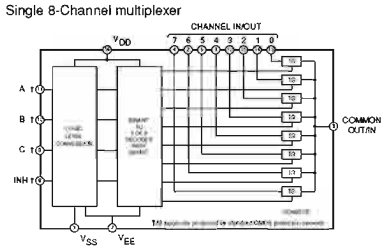
IC715: LC74781JM-9798
On-Screen Display Controller LSI



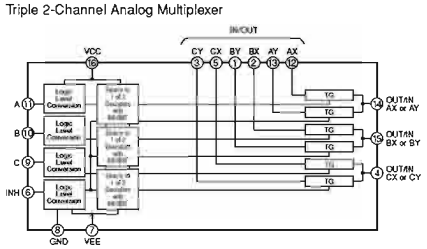
IC701, 703: MM74HC4051SJX
8-Channel Analog Multiplexer



IC705: CD4051BNSR
Single 8-Channel multiplexer

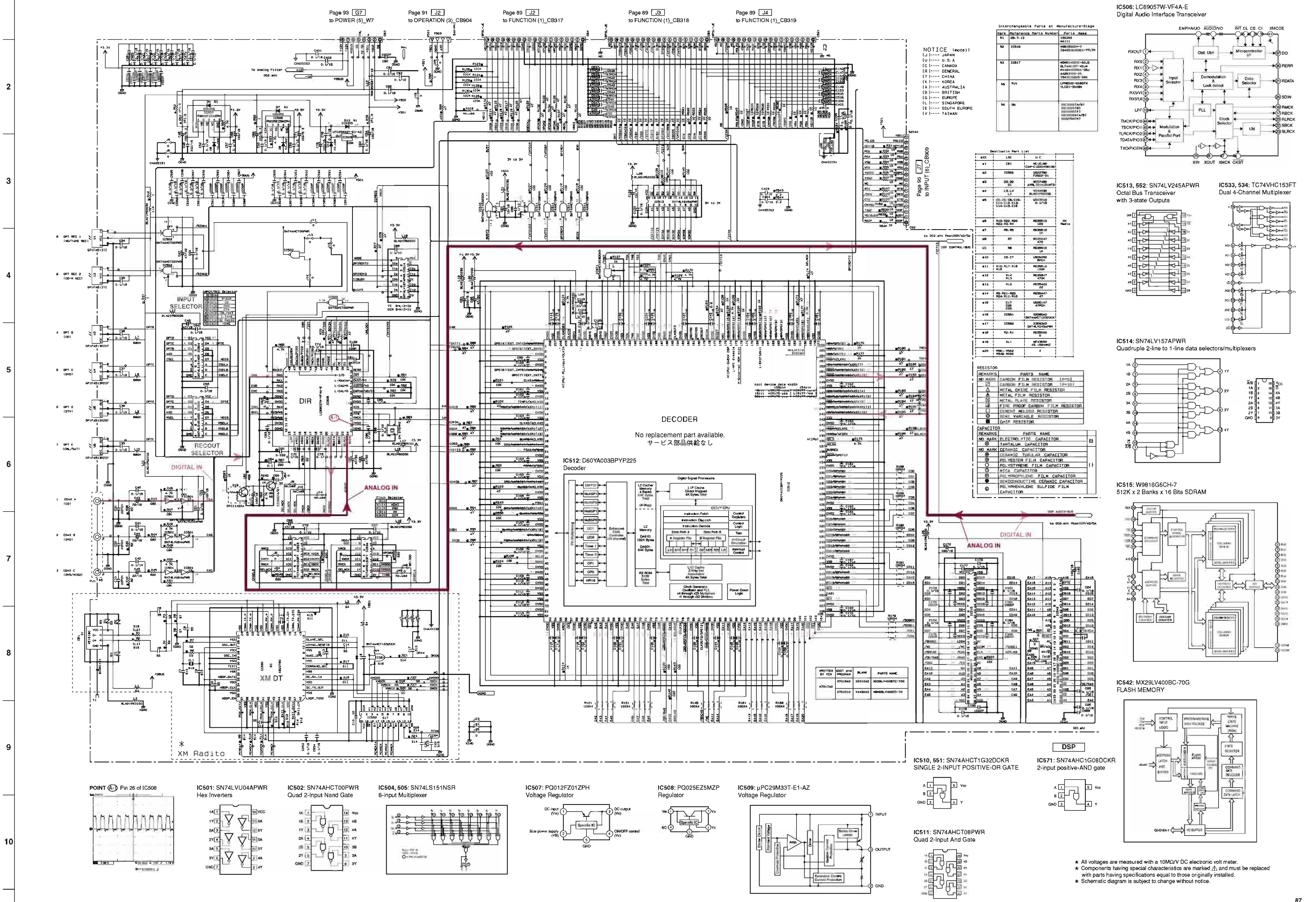


IC708, 716: MM74HC4053SJX
Triple 2-Channel Analog Multiplexer



★ All voltages are measured with a 10MΩ/V DC electronic volt meter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

■ SCHEMATIC DIAGRAM (DSP 1/2)



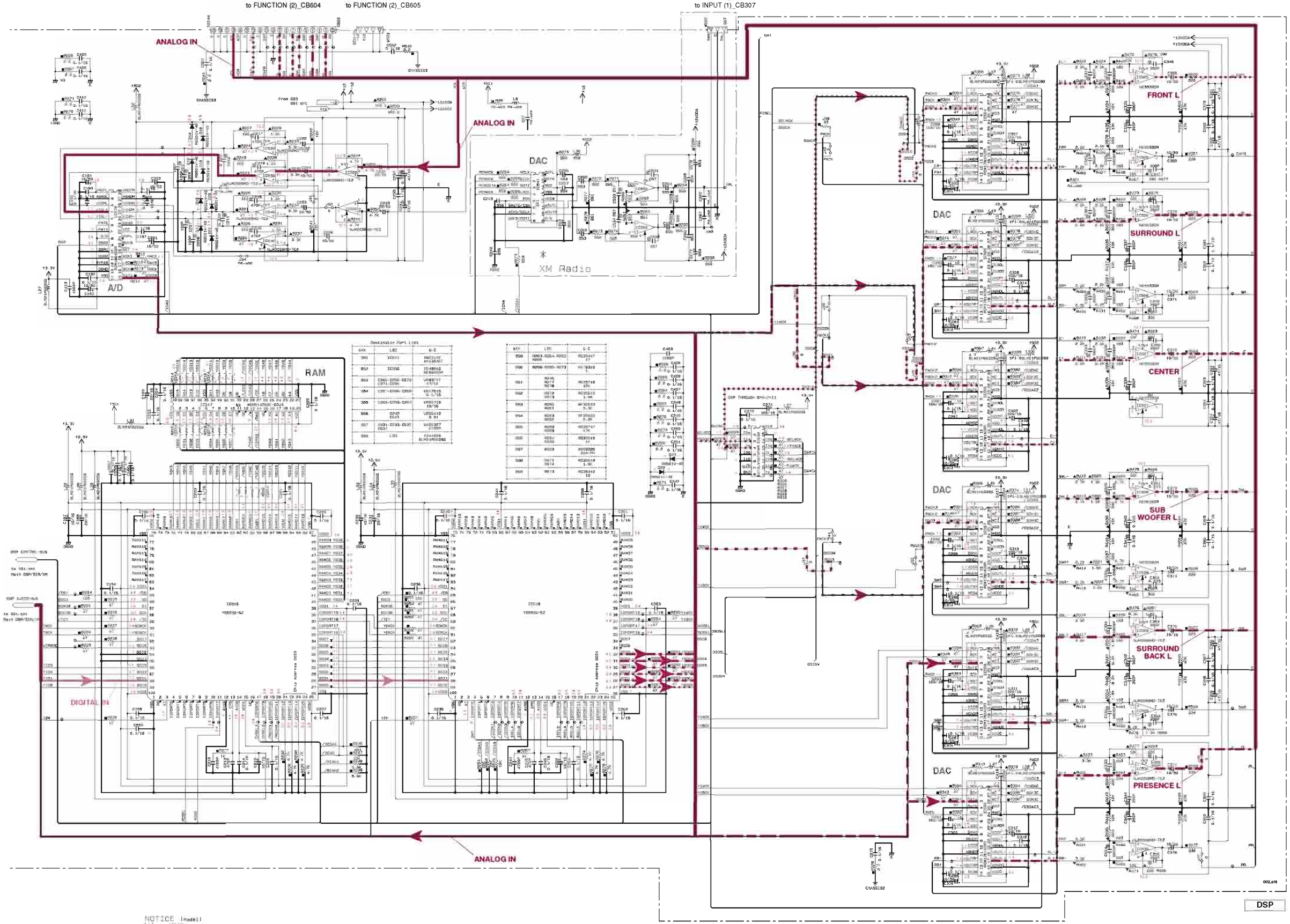
★ All voltages are measured with a 10MΩ/V DC electronic volt meter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

■ SCHEMATIC DIAGRAM (DSP 2/2)

Page 90 B6
to FUNCTION (2)_CB604

Page 90 B2
to FUNCTION (2)_CB605

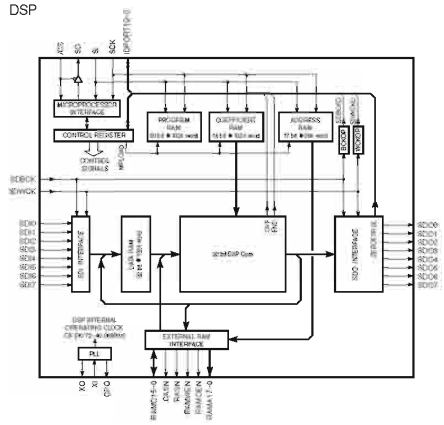
Page 94 C4
to INPUT (1)_CB307



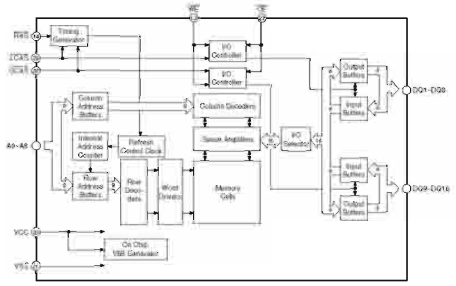
NOTICE (model)
(J)..... JAPAN
(U)..... U.S.A
(C)..... CANADA
(M)..... GENERAL
(T)..... CHINA
(K)..... KOREA
(A)..... AUSTRALIA
(B)..... BRITISH
(G)..... EUROPE
(L)..... SINGAPORE
(E)..... SOUTH EUROPE
(V)..... TAIWAN

★ All voltages are measured with a 10MΩ/V DC electronic volt meter.
★ Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
★ Schematic diagram is subject to change without notice.

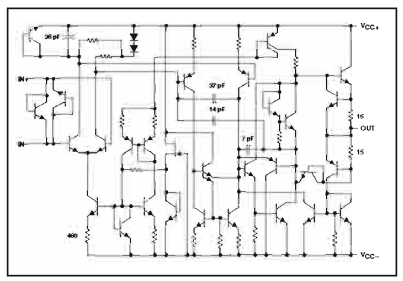
IC516, 518: YSS930-SZ
DSP



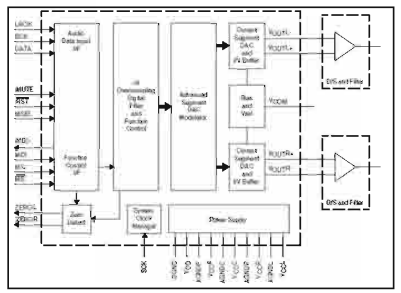
IC517: MSM514260E-60JS
4Mbit DRAM



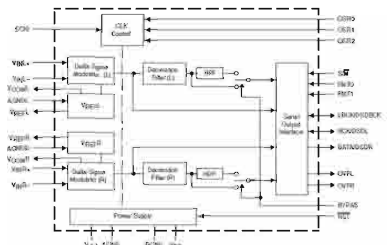
IC560: NE5532DR
DUAL LOW-NOISE OPERATIONAL AMPLIFIERS



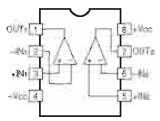
IC564~569: PCM1791ADBR
Audio stereo digital-to-analog converter



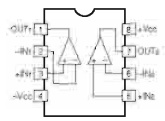
IC570: PCM1804DBR
Stereo A/D converter



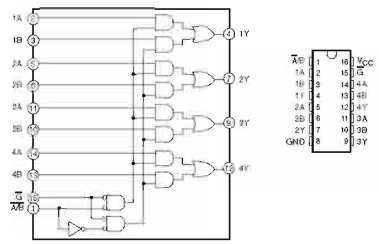
IC520, 529, 530, 539, 540: NJM2068MD-TE2
Dual OP-Amp



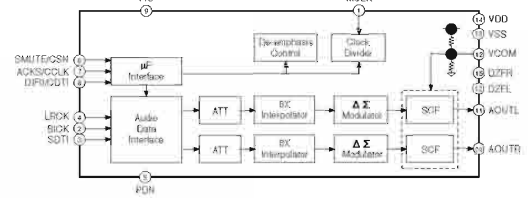
IC525~528: NE5532DR
Dual OP-Amp



IC532: SN74LV157APWR
Quadruple 2-line to 1-line data selectors/multiplexers



IC541: AK4384ET
D/A Converter



AV RECEIVER

HTR-5990

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel.
It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

■ CONTENTS

このサービスマニュアルは、エコマーク認定の再生紙を使用しています。
This Service Manual uses recycled paper.

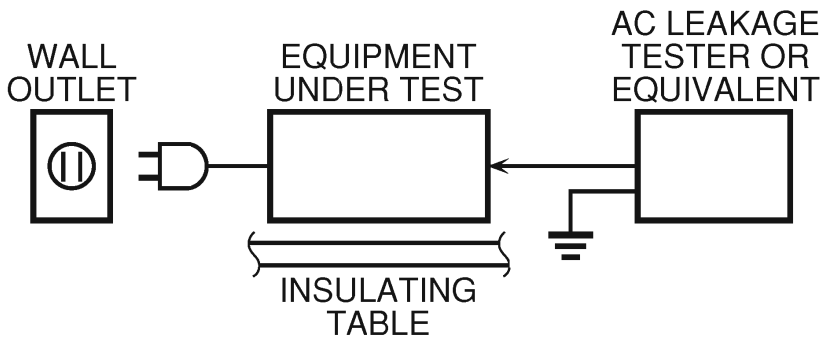
100982

YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan
'05 11

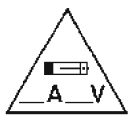
■ TO SERVICE PERSONNEL

1. Critical Components Information
   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Models Only)
   When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohms shunted by 0.15µF.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



"CAUTION"
"F2: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 10A, 125V FUSE."

CAUTION
F2: REPLACE WITH SAME TYPE 10A, 125V FUSE.

ATTENTION
F2: UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE DE 10A, 125V.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

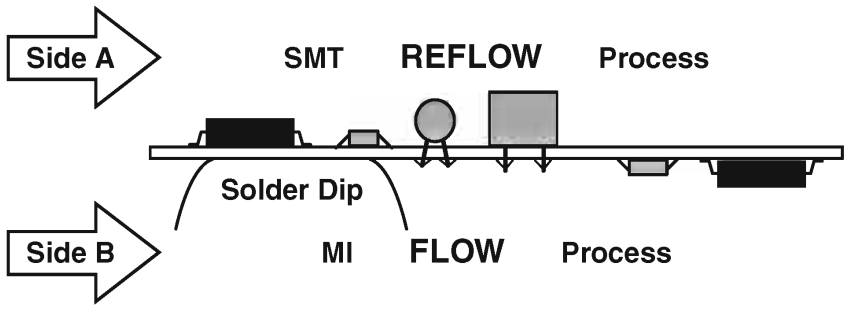
Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

About lead free solder

The P.C.B.s installed in this unit are soldered using the following solder.

	Side A	Side B
DSP P.C.B.	Lead Free Solder	Lead Free Solder
FUNCTION P.C.B.	Lead Free Solder	Lead Free Solder
OPERATION P.C.B.	–	Lead Free Solder
MAIN P.C.B.	–	Lead Free Solder
POWER PC.B.	–	Lead Free Solder
INPUT P.C.B.	Lead Free Solder	Lead Free Solder
A-VIDEO P.C.B.	Lead Free Solder	Lead Free Solder
D-VIDEO P.C.B.	Lead Free Solder	Lead Free Solder



Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

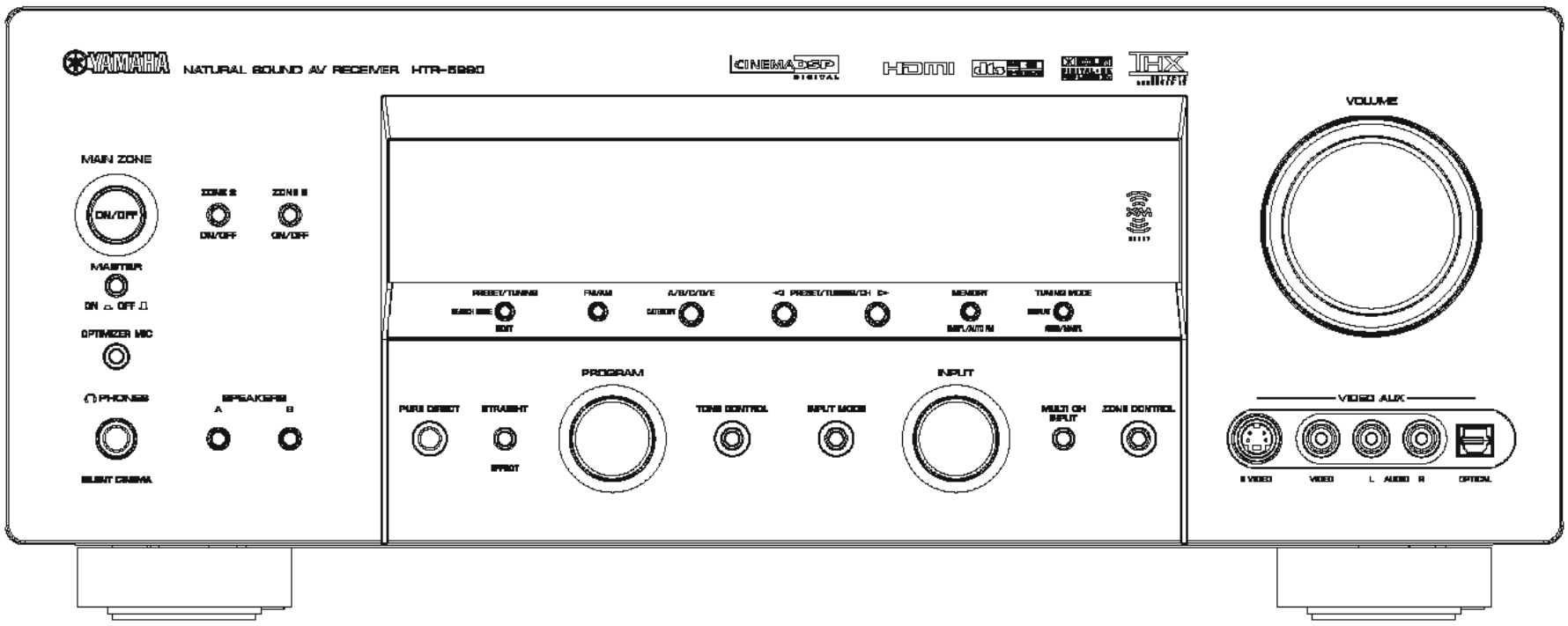
- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

Caution:

1. As the melting point temperature of the lead free solder is about 30°C to 40°C (50°F to 70°F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.
2. If lead solder must be used, be sure to remove lead free solder from each terminal section of the parts to be replaced and from the area around it completely before soldering, or make sure that the lead-free solder and lead solder melt together fully.

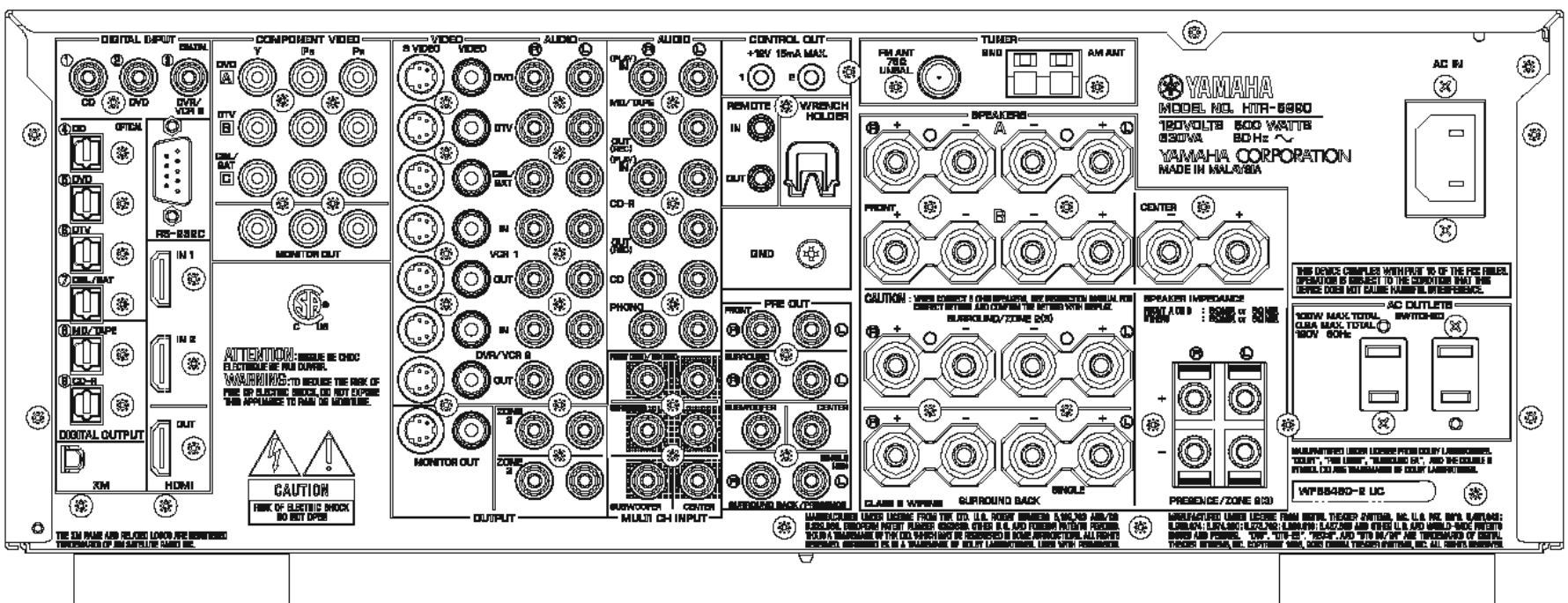
■ FRONT PANEL

U, C models



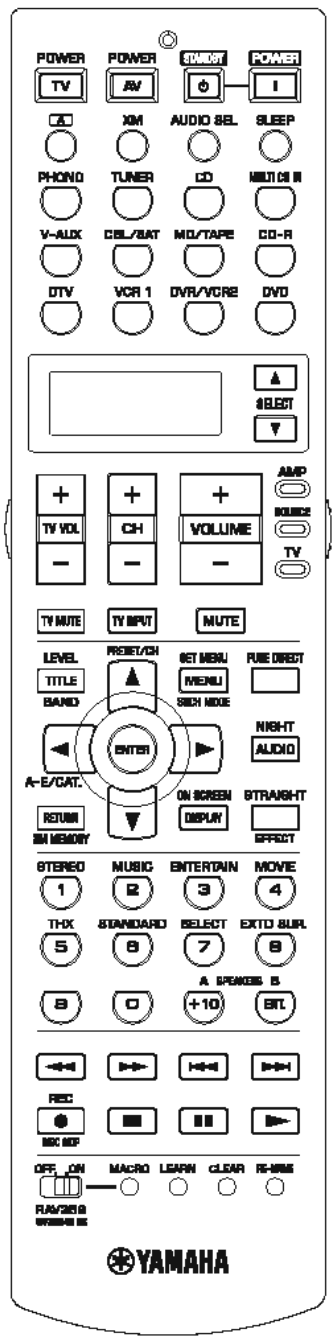
■ REAR PANEL

U, C models



■ REMOTE CONTROL PANEL

U, C models



■ SPECIFICATIONS / 参考仕様

■ Audio Section

Minimum RMS Output Power (Power Amp. Section) (20 Hz to 20 kHz, 0.04 % THD, 8 ohms)
- FRONT L/R ..... 120 W + 120 W
- CENTER ..... 120 W
- SURROUND L/R ..... 120 W + 120 W
- SURROUND BACK L/R ..... 120 W + 120 W

Dynamic Power Per Channel (IHF)
- FRONT L/R (8/6/4/2 ohms) ..... 155/195/250/330 W

Dynamic Headroom
- 8 ohms ..... 1.03 dB

Damping Factor (20 Hz to 20 kHz, SPEAKER-A, 8 ohms)
- FRONT L/R ..... 140 or more

Input Sensitivity / Input Impedance
- PHONO (MM) ..... 3.5 mV / 47 k-ohms
- CD, etc. ..... 200 mV / 47 k-ohms
- MULTI CH INPUT
  - FRONT L/R, CENTER, SURROUND L/R, SUBWOOFER ..... 200 mV / 47 k-ohms

Maximum Input Signal Level
- PHONO (MM) (1 kHz, 0.1 % THD) ..... 60 mV or more
- CD, etc. (1 kHz, 0.5 % THD) ..... 2.4 V or more

Output Level / Output Impedance
- REC OUT ..... 200 mV / 1.2 k-ohms
- PRE OUT (FRONT L/R, CENTER, SURROUND L/R, SURROUND BACK L/R) ..... 1.0 V / 500 ohms
- SUBWOOFER (20 Hz) ..... 2.0 V / 500 ohms
- ZONE 2 OUT ..... 1.0 V / 1.2 k-ohms
- ZONE 3 OUT ..... 1.0 V / 1.2 k-ohms

Headphone Jack Rated Output / Impedance
- CD, etc. INPUT (1 kHz, 40 mV, 8 ohms) ..... 150 mV / 100 ohms

Frequency Response (10 Hz to 100 kHz)
- CD, etc., PURE Direct to FRONT L/R ..... +0/-3.0 dB

RIAA Equalization Deviation
- 20 Hz to 20 kHz, PHONO (MM) ..... 0±0.5 dB

Total Harmonic Distortion (20 Hz to 20 kHz)
- PHONO (MM) to REC OUT (1V) ..... 0.02% or less
- CD, etc. (STEREO) to FRONT L/R SP OUT (60 W, 8 ohms) ..... 0.04% or less

Signal to Noise Ratio (IHF-A network)
- PHONO (MM) (Input shorted) to SP OUT 5 mV ..... 80 dB or more
- CD, etc. (Input shorted, STEREO) to SP OUT 250 mV ..... 100 dB or more

Residual Noise (IHF-A network)
- FRONT L/R SP OUT ..... 150 µV or less

Channel Separation (STEREO)
- PHONO (Input shorted, 1 kHz/10 kHz) ..... 60 dB or more/55 dB or more
- CD, etc. (Input 5.1 k-ohms shorted, 1 kHz/10 kHz) ..... 60 dB or more/45 dB or more

Tone Control Characteristics
- BASS
  - Boost/Cut ..... ±6 dB (50 Hz)
  - Turnover Frequency ..... 350 Hz
- TREBLE
  - Boost/Cut ..... ±6 dB (20 kHz)
  - Turnover Frequency ..... 3.5 kHz

Zone2/Zone3 Tone Control Characteristics
- BASS
  - Boost/Cut ..... ±10 dB (100 Hz)
  - Turnover Frequency ..... 450 Hz
- TREBLE
  - Boost/Cut ..... ±10 dB (20 kHz)
  - Turnover Frequency ..... 1.5 kHz

Filter Characteristics
- FRONT, CENTER, SURROUND, SURROUND BACK SP Small (H.P.F.) ..... fc=40/60/80/90/100/110/120/160/200 Hz / 12 dB oct.
- SUBWOOFER (L.P.F.) ..... fc=40/60/80/90/100/110/120/160/200 Hz / 24 dB oct.

■ Video Section

Video Signal Type
- Monitor Out (Gray Back) ..... NTSC
- Video Conversion ..... NTSC/PAL

Composite Video Signal Level
- ..... 1 Vp-p / 75 ohms

S-Video Signal Level
- Y ..... 1 Vp-p / 75 ohms
- C ..... 0.286 Vp-p / 75 ohms

Component Video Signal Level
- Y ..... 1 Vp-p / 75 ohms
- Pb/Pr ..... 0.7 Vp-p / 75 ohms

Video Maximum Input Level
- ..... 1.5 Vp-p or more

Video Signal to Noise Ratio
- ..... 60 dB or more

Monitor Out Frequency Response
- Component Video Signal ..... 5 Hz to 100 MHz, ±3 dB

■ FM Section

Tuning Range
- ..... 87.5 to 107.9 MHz

50dB Quieting Sensitivity (IHF) (1 kHz, 100 % MOD.)
- Mono ..... 2.0 µV (17.3 dBf)
- Stereo ..... 25 µV (39.2 dBf)

Usable Sensitivity (IHF)
- Mono ..... 1.0 µV (11.2 dBf)

Selectivity
at 400 kHz ..... 70 dB

Signal to Noise Ratio (IHF)
Mono ..... 76 dB
Stereo ..... 70 dB

Harmonic Distortion (1 kHz)
Mono ..... 0.2 %
Stereo ..... 0.3 %

Stereo Separation (1 kHz)
..... 42 dB

Frequency Response (20 Hz to 15 kHz)
..... +0.5 / -2 dB

Antenna Input
..... 75 ohms unbalanced

■ **AM Section**

Tuning Range
..... 530 to 1,710 kHz

Usable Sensitivity
..... 300 µV/m

Antenna Input
..... Loop Antenna

■ **General**

Power Supply
..... AC 120 V, 60 Hz

Power Consumption
..... 500 W / 630 VA

Standby Power Consumption (reference data)
..... 0.1 W or less

AC Outlets
2 Switched Outlets
..... 100 W max. total / 0.8 A max. total

Dimensions (W x H x D)
..... 435 x 171 x 424 mm (17-1/8" x 6-3/4" x 16-11/16")

Weight
..... 16.8 kg (37 lbs.)

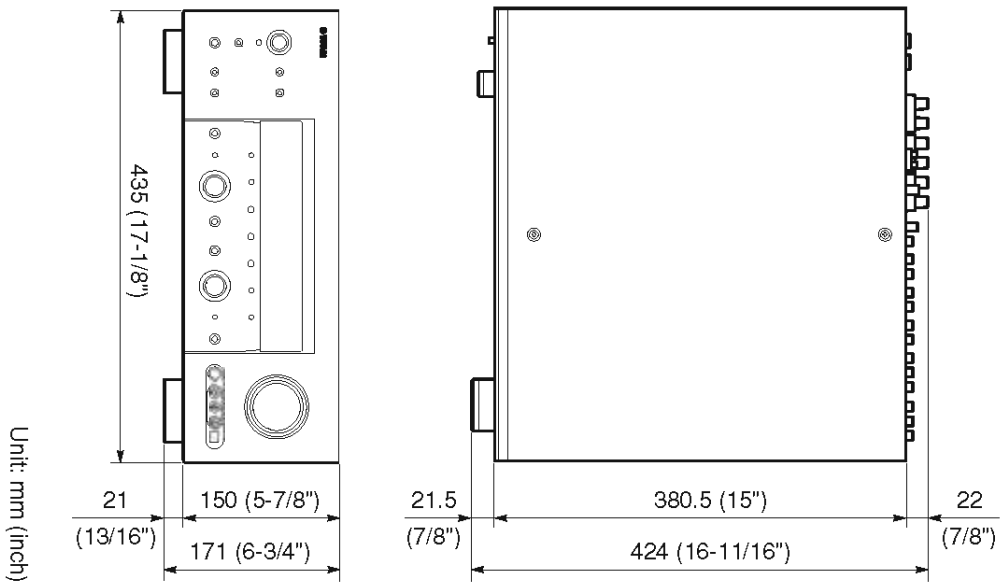
Finish
Black Color ..... U, C models

Accessories
Remote Control x 1, Batteries (Manganese Dry) x 4, Indoor FM Antenna x 1, AM Loop Antenna x 1, Optimizer Microphone x 1, Power Cable x 1, Speaker Terminal Wrench x 1

* Specifications are subject to change without notice due to product improvements.

U ..... U.S.A. model *C ..... Canadian model*

• DIMENSIONS



• SOUND/SURROUND SELECT MENU

Sound Select **Min./Max./Step**

Main Menu	Parameter	Center Level 0 / 100 / 1 %	Surround L Level 0 / 100 / 1 %	Surround R Level 0 / 100 / 1 %	Sur. Back Level 0 / 100 / 1 %		Presence L Level 0 / 100 / 1 %	Presence R Level 0 / 100 / 1 %	Initialize NO / YES	DIRECT AUTO / OFF
STEREO	2ch Stereo	-	-	-	-	-	-	-	-	AUTO
	7ch Stereo	100	100	100	50 (LRG1)	35 (LRG2)	33	33	NO	-

Surround Select **Min./Max./Step**

		Decode Type -6 / +3 / 1 dB	DSP Level 1 / 99 / 1 ms	Init. Delay 0.1 / 2.0 / 0.1	Room Size 0 / 10 / 1	Liveness 1 / 49 / 1 ms	Sur. Init. Delay 0.1 / 2.0 / 0.1	Sur. Room Size 1 / 49 / 1 ms	SB Init. Delay 0.1 / 2.0 / 0.1	SB Room Size 1.0 / 5.0 /0.1 ms	Rev. Time 0 / 250 / 1 ms	Rev. Delay 0 / 100 / 1 %	Rev. Level 0 / 5 / 1	Dialogue Lift NO / YES	Initialize
MUSIC	Vienna		0	30	1.0	5	-	-	-	-	-	-	-	(0)	NO
	The Bottom Line		0	30	1.0	5	-	-	-	-	-	-	-	(0)	NO
	The Roxy Theater		0	15	1.0	5	-	-	-	-	1.6	120	9	(0)	NO
	Pop/Rock			21	1.0	-	-	-	-	-	-	-	-	(0)	NO
ENTERTAINMENT	TV Sports		0	10	1.0	-	30	1.0	(15)	(1.0)	1.6	100	4	(0)	NO
	Mono Movie		0	69	1.0	3	-	-	-	(1.0)	2.5	160	2	(0)	NO
	Game		0	36	1.0	-	15	1.0	(15)	(1.0)	-	-	-	(0)	NO
	Disco		0	26	-	5	-	-	-	-	2.7	120	4	(0)	NO
MOVIE THEATER	Spectacle	Pro Logic	0	13	1.0	-	23	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	13	1.0	-	32	1.0	15	1.0	-	-	-	(0)	NO
		Neo : 6	0	13	1.0	-	32	1.0	15	1.0	-	-	-	(0)	NO
	Sci-Fi	Pro Logic	0	16	1.0	-	20	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	16	1.0	-	2	1.0	15	1.0	-	-	-	(0)	NO
		Neo : 6	0	16	1.0	-	2	1.0	15	1.0	-	-	-	(0)	NO
	Adventure	Pro Logic	0	15	1.0	-	20	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	15	1.0	-	30	1.0	15	1.0	-	-	-	(0)	NO
		Neo : 6	0	15	1.0	-	30	1.0	15	1.0	-	-	-	(0)	NO
	General	Pro Logic	0	15	1.0	-	20	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	15	1.0	-	26	1.0	15	1.0	-	-	-	(0)	NO
		Neo : 6	0	15	1.0	-	26	1.0	15	1.0	-	-	-	(0)	NO

Main Menu	Sub Menu	Parameter	Setting value ([ ] Initial value) / 設定値 ([ ] 初期値)	
THX	Cinema	Decode Type	[Pro Logic]	
			Pro Logic II x	
			Neo : 6	
	MUSIC			
	GAME			
SURROUND	Standard	Decode Type	[Pro Logic]	
			PL II x Movie	
			PL II x Music	
			PL II x Game	
			Neo : 6 Cinema	
			Neo : 6 Music	
		Panorame	[OFF] / ON	} (Setting can be made when Pro Logic II x is selected)
		Dimension	-3 / +3 / 1 [STD]	
		Center Width	0 / 7 / 1 [3]	
		Center Image	0.0 / 1.0 / 0.1 [0.3]	(Setting can be made when Neo:6 Music is selected)
		Initialize	[NO] / YES	

	Parameter	Decode Type	DSP Level	Sur. Init. Delay	Sur. Room Size	Sur. Liveness	SB Init. Delay	SB Room Size	SB Liveness	Dialogue Lift	Initialize
			-6 / +3 / 1 dB	1 / 49 / 1 ms	0.1 / 2.0 / 0.1	1 / 5 / 1	1 / 49 / 1 ms	0.1 / 2.0 / 0.1	1 / 5 / 1	0 / 5 / 1	NO / YES
	Enhanced	Pro Logic	0	20	1.0	3	(15)	(1.0)	(5)	(0)	NO
		Pro Logic II x	0	19	1.0	3	15	1.0	5	(0)	NO
		Neo 6	0	19	1.0	3	15	1.0	5	(0)	NO
STRAIGHT											

• **SET MENU TABLE**

AUTO SETUP

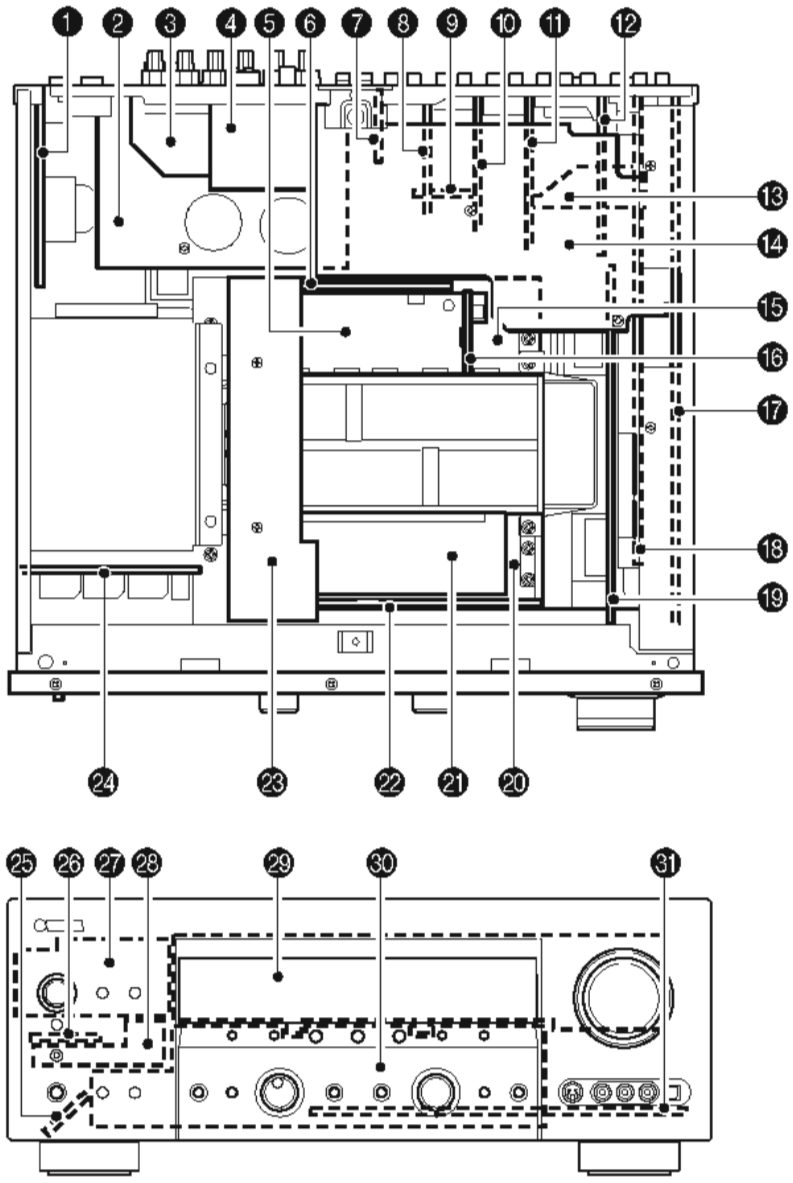
MAIN MENU	PARAMETER
SETUP	AUTO / RELOAD
WIRING	CHECK / SKIP
DISTANCE	
SIZE	
EQ	NATURAL / SKIP / FLAT / FRONT
LEVEL	CHECK / SKIP
	START / [ENTER]

MANUAL SETUP

	MAIN MENU		SUB MENU	PARAMETER	SETTING VALUE ([ ] INITIAL VALUE)
1	BASIC	A	SPEAKER SET	BASS OUT	[SWFR] / FRONT / BOTH
				FRONT	LARGE / [SMALL]
				CENTER	[SMALL] / LARGE / NONE
				SUR. L/R	[SMALL] / LARGE / NONE
				SUR. B	[SMLx2] / LRGx1 / LRGx2 / NONE / SMLx1
				PRESENCE	[NONE] / YES
				Cross Over	40 / 60 / [80] / 90 / 100 / 110 / 120 / 160 / 200 Hz
				SWFR PHASE	[NRM] / REV
				PRIORTY	[SUR. B] / PRES
		B	SP LEVEL	FRONT L	-----II----- -10.0 ~ +10.0dB 0.5dB step [0.0dB]
				FRONT R	
				CENTER	
				SURROUND L	
				SURROUND R	
				SURROUND BACK L	
				SURROUND BACK R	
				SUBWOOFER	
				PRESENCE L	
				PRESENCE R	
		C	SP DISTANCE	UNIT	meters / feet
				FRONT L	0.3 ~ 24.0m, 0.1m step [3.00m] / 1.0 ~ 80.0ft, 0.5ft step [10.0ft]
				FRONT R	
				CENTER	
				SURROUND L	
				SURROUND R	
				SURROUND BACK L	
				SURROUND BACK R	
				SWFR.	
				PRESENCE L	
				PRESENCE R	
		D	THX SET	SB Dist.	Under 0.3m / [0.3-1.2m] / Over 1.2m, Under 1ft / [1-4ft] / Over 4ft
		E	TEST TONE	TEST TONE	[OFF] / ON
2	SOUND	A	EQUALIZER	EQ SELECT	[PEQ] / GEQ / OFF
		B	LFE LEVEL	SPEAKER	-20dB ~ ±0.0dB, 1.0dB step [±0.0dB]
				HEADPHONE	
		C	DYNA. RANGE	SPEAKER	[MAX] / MIN / STD
				HEADPHONE	
		D	AUDIO SET	Mute Type	[FULL] / -20dB
				A. DELAY	0 ~ 240ms, 1ms step [0ms]
				T. BYPASS	[AUTO] / OFF
				DUAL MONO (J model)	[MAIN] / SUB / ALL
		E	HDMI SET	S. AUDIO	[5990 (model)] / OTHER
3	INPUT	A	I/O ASSIGN	C. V [A] [DVD]	DVD / DTV / CBL/SAT / VCR1 / DVR/VCR2 / V-AUX / XM
				C. V [B] [DTV]	
				C. V [C] [CBL/SAT]	
				COAXIAL IN (1) [CD]	CD / CD-R / MD/TAPE / DVD / DTV / CBL/SAT / VCR1 / DVR/VCR2 / V-AUX / PHONO
				COAXIAL IN (2) [DVD]	
				COAXIAL IN (3) [DVR/VCR2]	
				OPTICAL IN (4) [CD]	CD / CD-R / MD/TAPE / DVD / DTV / CBL/SAT / VCR1 / DVR/VCR2 / V-AUX / PHONO
				OPTICAL IN (5) [DVD]	
				OPTICAL IN (6) [DTV]	
				OPTICAL IN (7) [CBL/SAT]	
				OPTICAL OUT (8) [MD/TAPE]	CD / CD-R / MD/TAPE / DVD / DTV / CBL/SAT / VCR1 / DVR/VCR2 / V-AUX / PHONO
				OPTICAL OUT (9) [CD-R]	
				HDMI IN1 [DVD]	CD / CD-R / MD/TAPE / DVD / DTV / CBL/SAT / VCR1 / DVR/VCR2 / V-AUX / PHONO
				HDMI IN2 [CBL/SAT]	

	MAIN MENU		SUB MENU	PARAMETER	SETTING VALUE ([ ] INITIAL VALUE)
		B	INPUT RENAME	DVD	Input is possible to 8 characters Input possible Character type CAPITAL A to Z SMALL a to z FIGURE 0 to 9 Space MARK # * + , - . / : < > ? etc.
				DVR/VCR2	
				VCR1	
				DTV	
				CD-R	
				MD/TAPE	
				CBL/SAT	
				V-AUX	
				CD	
				TUNER	
				PHONO	
		C	VOLUME TRIM	PHONO	-6.0 ~ +6.0, 0.5dB step [0.0dB]
				CD	
				CD-R	
				MD/TAPE	
				DVD	
				DTV	
				CBL/SAT	
				VCR1	
				DVR/VCR2	
				V-AUX	
		D	DECODER MODE	CD	[AUTO] / DTS / AAC (J model)
				DVD	
				DTV	
				CBL/SAT	
				DVR/VCR2	
				MD/TAPE	
				DVD	
				DTV	
				VCR1	
				V-AUX	
		E	MULTI CH INPUT	INPUT CH	[6CH] / 8CH
4	OPTION	A	DISPLAY SET	DIMMER	-4 ~ 0, 1 step [0]
				OSD SHIFT	-5 ~ +5, 1 step [0]
				GRAY BACK	[AUTO] / OFF
				V CONV.	[ON] / OFF
				CMPNT I/P	ON / [OFF]
				HDMI I/P	[ON] / OFF
		B	MEMORY GUARD		[OFF] / ON
		C	AUDIO SELECT		[AUTO] / LAST
		D	DECODER MODE		[AUTO] / LAST
		E	PARAM. INI	STEREO	Param No Change / *
				MUSIC	
				ENTERTAIN	
				MOVIE	
				STANDARD	
		F	ZONE SET	SP B	[MAIN] / ZONE B
				ZONE2 VOL	[VAR] / FIX
				ZONE3 VOL	
				ZONE2 AMP	[EXT] / SUR / PRNS / BOTH
				ZONE3 AMP	
		G	XM RADIO SET (U, C models)	DISPLAY	OFF / [10s] / 30s / ON
				ANTENNA	NONE, 0 ~ 100%

■ INTERNAL VIEW



1. POWER (2) P.C.B.
2. MAIN (1) P.C.B.
3. MAIN (5) P.C.B.
4. TUNER
5. MAIN (3) P.C.B.
6. POWER (4) P.C.B.
7. INPUT (3) P.C.B.
8. INPUT (1) P.C.B.
9. INPUT (4) P.C.B.
10. INPUT (2) P.C.B.
11. A-VIDEO (2) P.C.B.
12. A-VIDEO (1) P.C.B.
13. INPUT (5) P.C.B.
14. FUNCTION (1) P.C.B.
15. MAIN (2) P.C.B.
16. POWER (7) P.C.B.
17. DSP P.C.B.
18. D-VIDEO P.C.B.
19. FUNCTION (2) P.C.B.
20. MAIN (4) P.C.B.
21. POWER (5) P.C.B.
22. POWER (1) P.C.B.
23. OPERATION (6) P.C.B.
24. POWER (3) P.C.B.
25. OPERATION (4) P.C.B.
26. OPERATION (5) P.C.B.
27. OPERATION (2) P.C.B.
28. OPERATION (7) P.C.B.
29. INPUT (6) P.C.B.
30. OPERATION (1) P.C.B.
31. OPERATION (3) P.C.B.

■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)
Disconnect the power cable from the AC outlet.

1. Removal of Top Cover

a. Remove 2 screws (①), 4 screws (②) and 5 screws (③). (Fig. 1)
b. Slide the Top Cover rearward to remove it. (Fig. 1)

2. Removal of Front Panel Unit

a. Remove 7 screws (④), 2 screws (⑤) and then slide the Front Panel Unit forward. (Fig. 1)
b. Remove CB2, CB14, CB904 ~ CB907 and CB913. (Fig. 2)

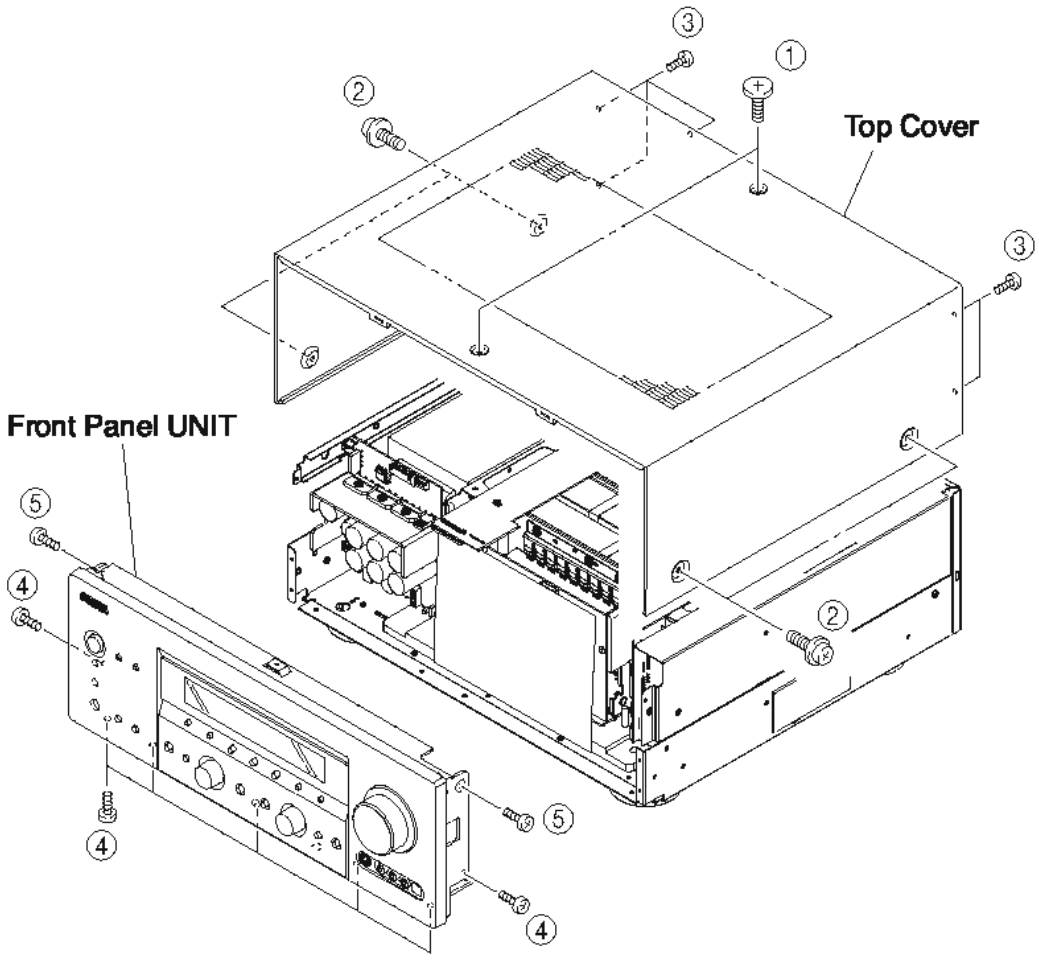


Fig. 1

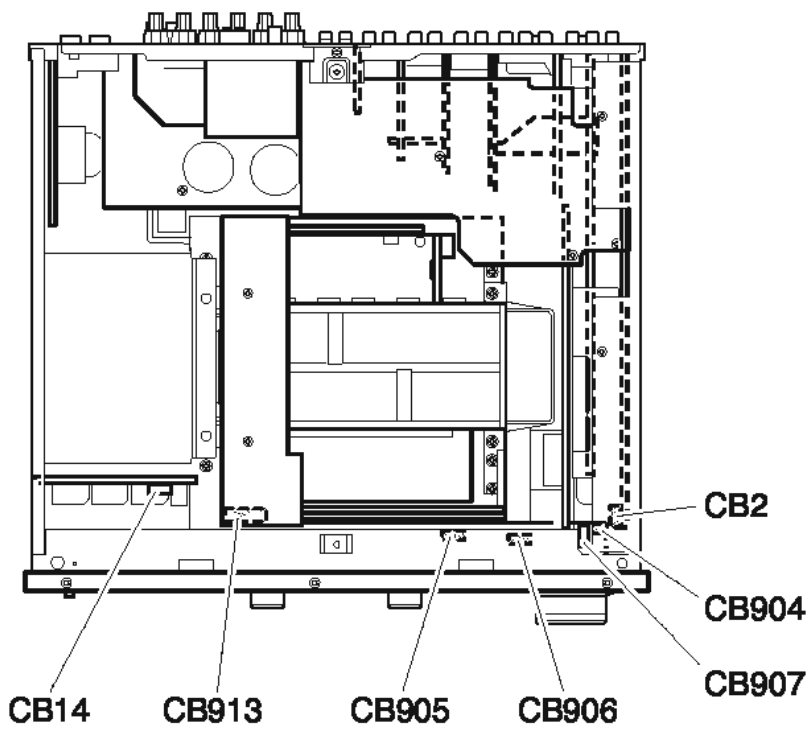


Fig. 2

3. Removal of FUNCTION (1) P.C.B.

a. Remove 4 screws (⑥) and then remove the Bracket. (Fig. 4)
b. Remove 1 screw (⑦) and then remove the Support Top. (Fig. 4)
c. Remove 1 screw (⑧) and 4 screws (⑨). (Fig. 4)
d. Remove CB301 and CB303 ~ CB306. (Fig. 3)
e. Remove the FUNCTION (1) P.C.B. which is connected directly to the lower P.C.B. with connectors. (Fig. 4)

4. Removal of DSP, FUNCTION (2), INPUT (5), D-VIDEO, A-VIDEO (1), (2) P.C.B.s

a. Remove 2 push rivets (⑩) and then remove the Duct. (Fig. 4)
b. Remove 1 screw (⑪). (Fig. 4)
c. Remove 21 screws (⑫) and 2 jack screws (⑬). (Fig. 5)
d. Remove CB40, CB44, CB307, CB325, CB332, CB506, CB508, CB602, CB603, CB606, CB608 and CB609. (Fig. 3)
e. Remove the DSP, FUNCTION (2), INPUT (5), D-VIDEO, A-VIDEO (1) and (2) P.C.B.s.. (Fig. 3)

5. Removal of INPUT (1) ~ (4) P.C.B.s

a. Remove 14 screws (⑭). (Fig. 5)
b. Remove CB324. (Fig. 3)
c. Remove the INPUT (1) ~ (4) P.C.B.s.. (Fig. 3)

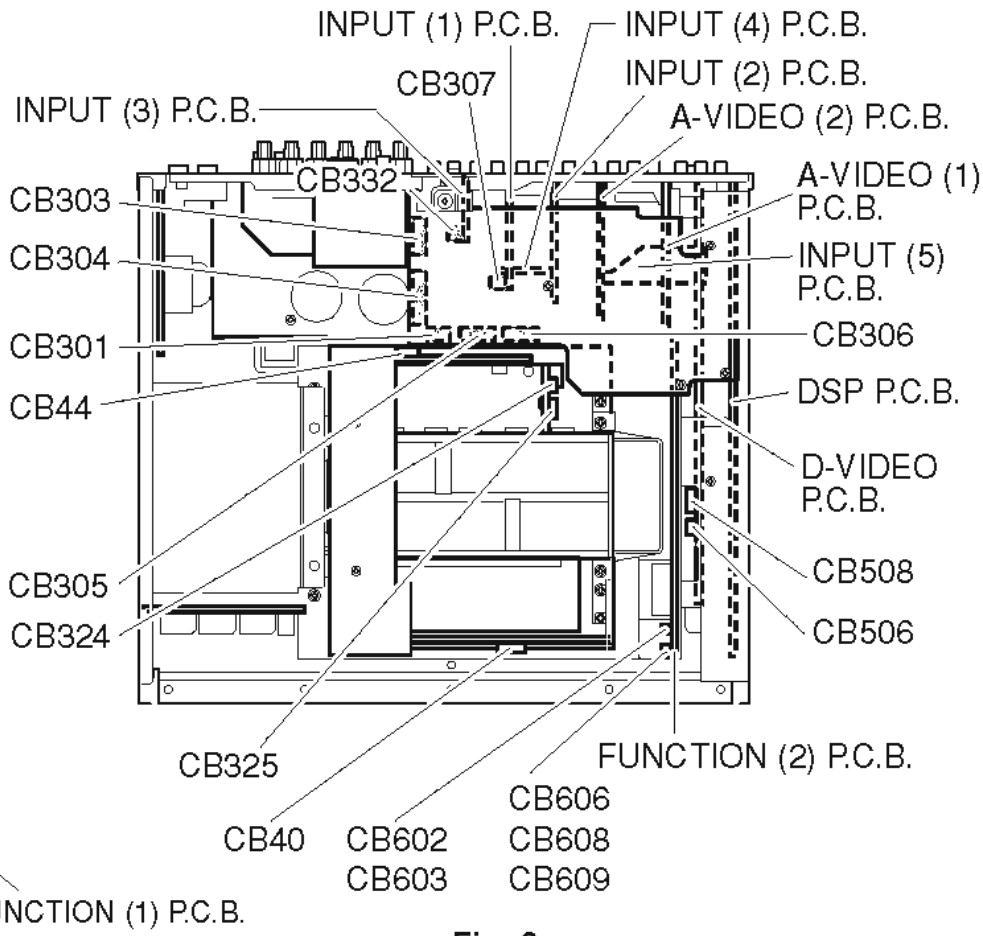


Fig. 3

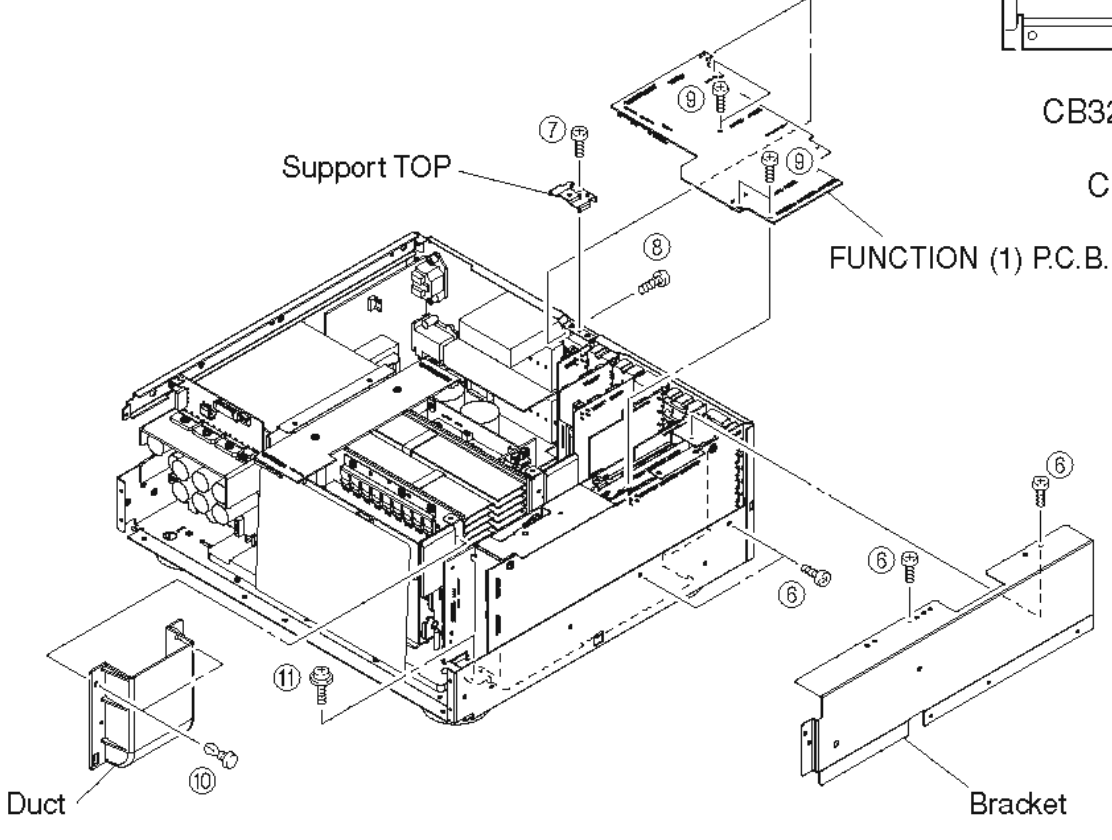


Fig. 4

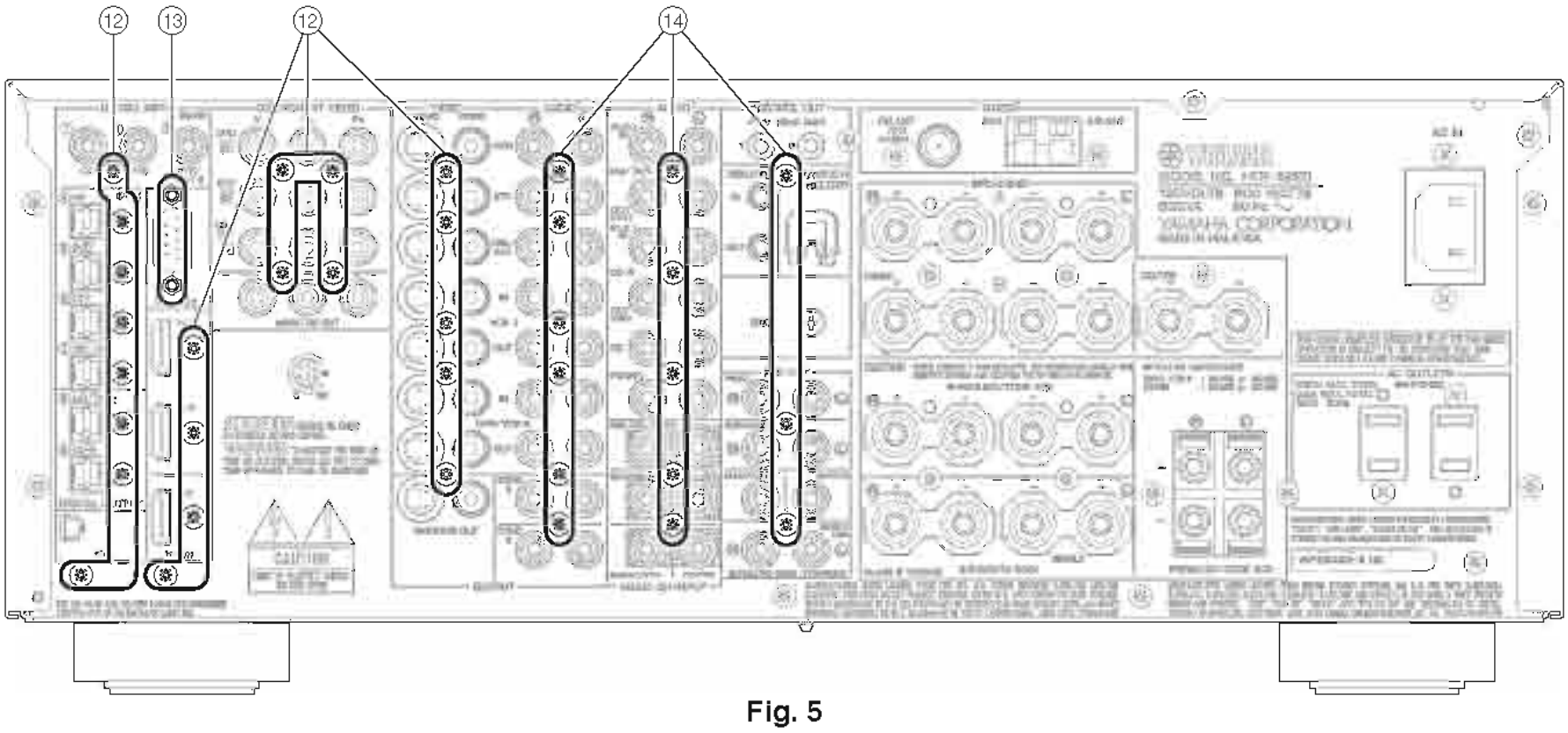


Fig. 5

When checking the P.C.B.:

- Put the Rubber Sheet and the Cloth over the equipment. Then place the P.C.B. upside down on the Cloth and check it. (Fig. A)
- Reconnect all cables (connectors) that have been disconnected.
  Be sure to use the extension cable for servicing for the following section.
  DSP P.C.B. CB2 – INPUT (6) P.C.B. CB909:
  MF117350 (17P 350mm)
  OPERATION (6) P.C.B. CB912 – FUNCTION (1) P.C.B. CB304:
  MF131500 (31P 500mm)
  FUNCTION (1) P.C.B. CB301 – POWER (2) P.C.B. W1:
  MF408250 (8P 250mm)
  A-VIDEO (2) P.C.B. W702 – POWER (7) P.C.B. CB325:
  MF404250 (4P 250mm)
- When connecting the cable, use care for the polarity.

- In this unit, the ground of P.C.B.s shown below is connected to the rear panel. When these P.C.B.s are removed from the rear panel, connect the ground to the rear panel or chassis, using a lead wire or the like. (Fig. B)

DSP P.C.B.	: PJ1 (DIGITAL INPUT)
D-VIDEO P.C.B.	: CN301 (HDMI OUT)
A-VIDEO (1) P.C.B.	: PJ602 (MONITOR OUT)
A-VIDEO (2) P.C.B.	: JK703 (MONITOR OUT)
INPUT (1) P.C.B.	: PJ304 (MULTI CH INPUT)
INPUT (2) P.C.B.	: PJ307 (ZONE3 OUTPUT)
INPUT (3) P.C.B.	: PJ309 (PRE OUT)

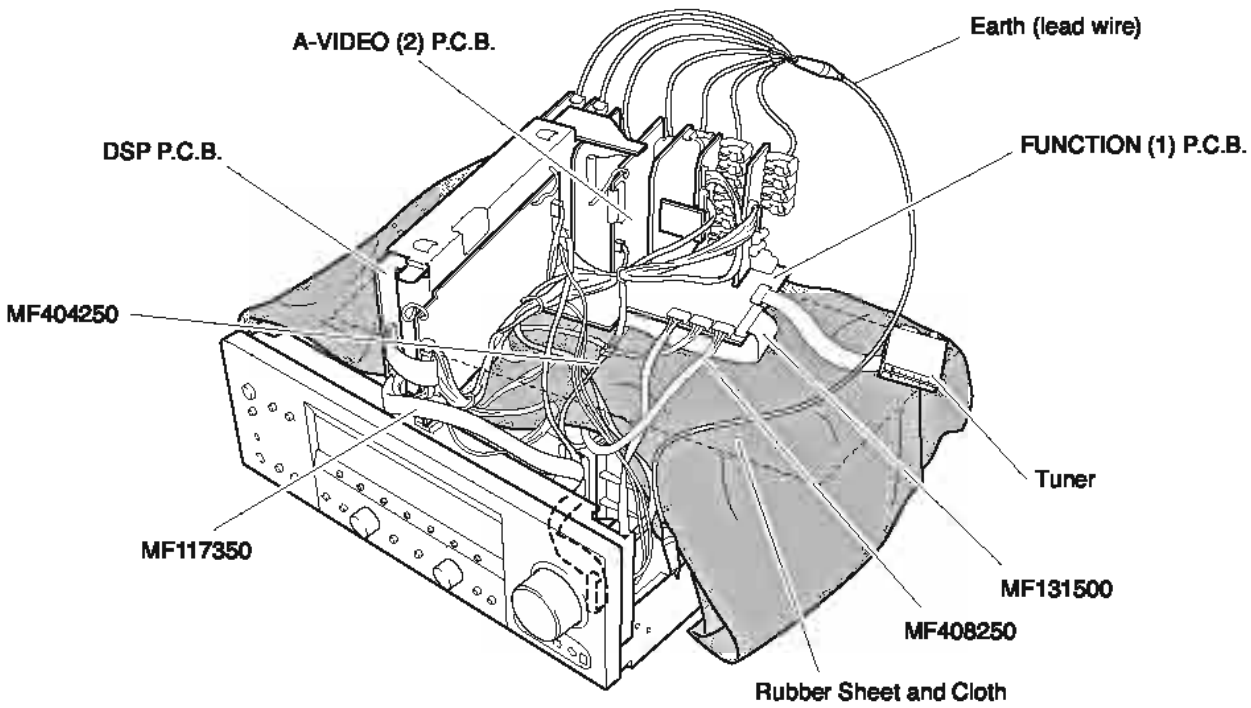


Fig. A

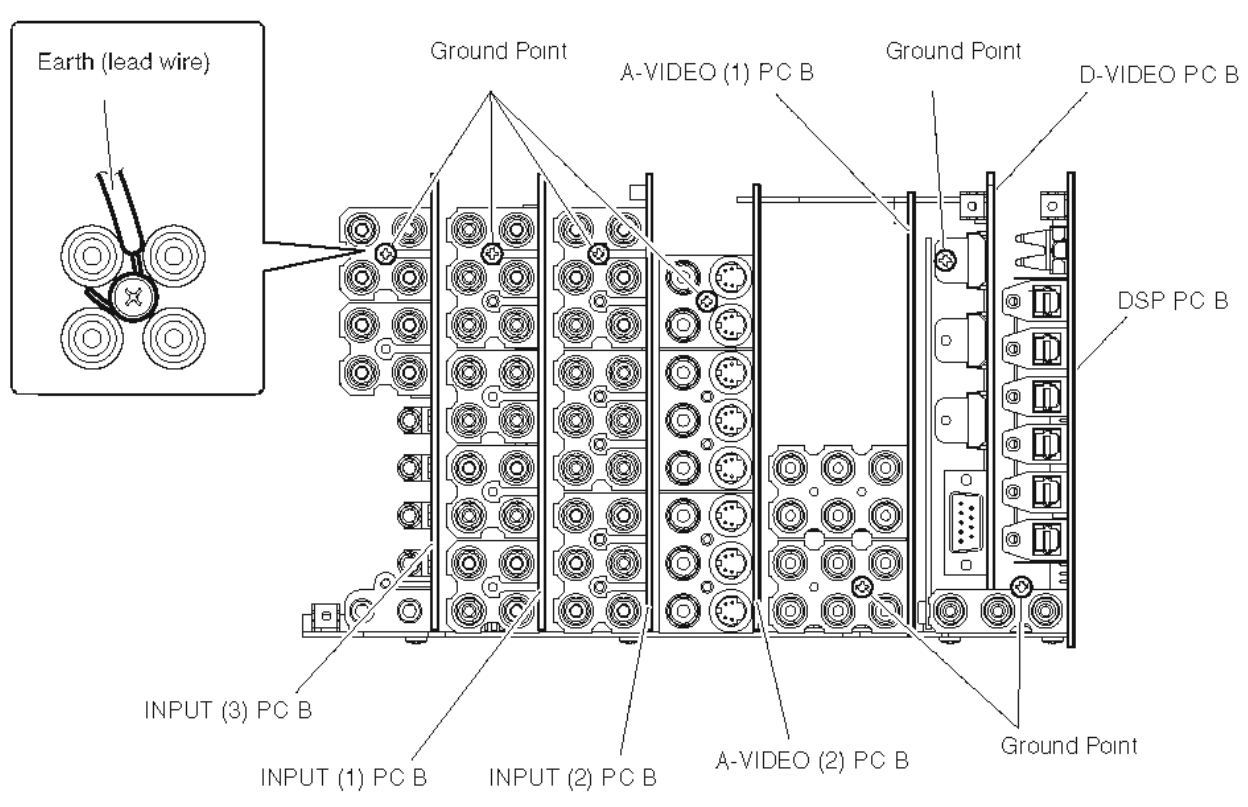


Fig. B

6. Removal of OPERATION (6) P.C.B.

a. Remove 2 screws (⑮). (Fig. 6)

b. Remove the OPERATION (6) P.C.B. which is connected directly to the lower P.C.B. with connectors. (Fig. 6)

7. Removal of Fan

a. Remove CB20. (Fig. 6)

b. Remove 2 screws (⑯). (Fig. 6)

c. Remove the Fan together with the frame by lifting them up. (Fig. 6)

8. Removal of Amp Unit

a. Remove 4 screws (⑰) and 4 screws (⑱). (Fig. 6)

b. Remove the Amp Unit. (Fig. 6)

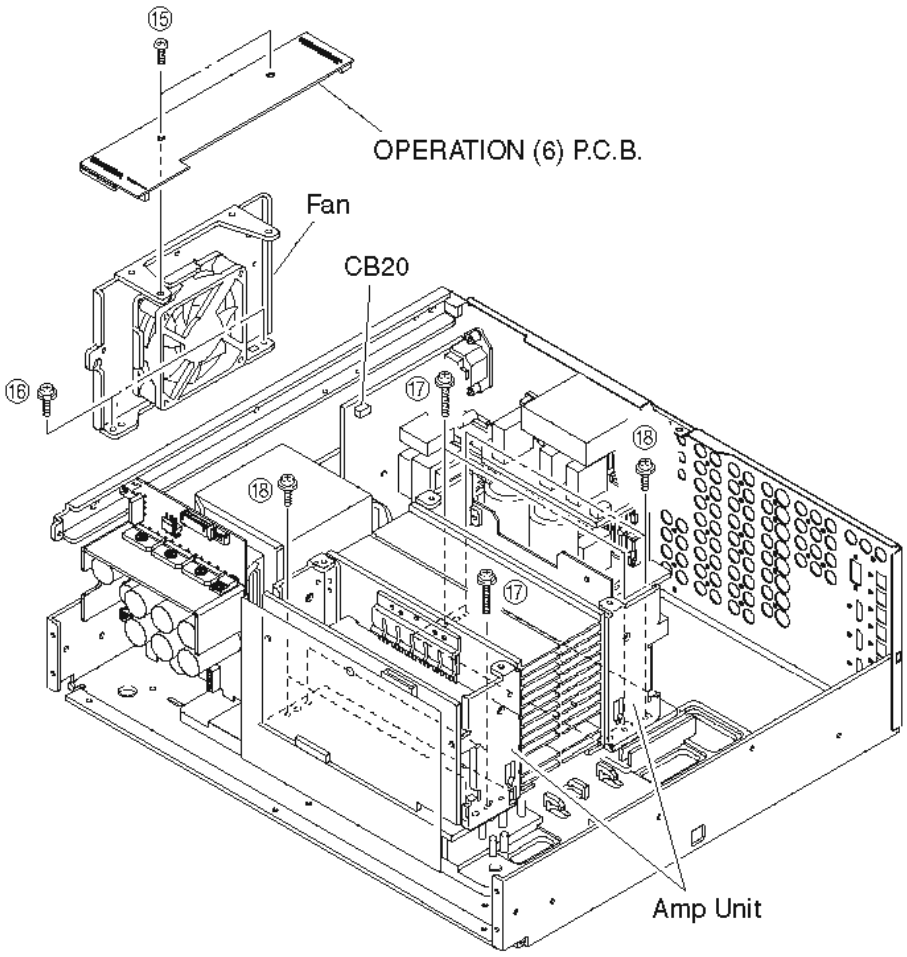


Fig. 6

When checking the Amp Unit:

- The Front Panel Unit put on the Rubber Sheet and the Cloth and check it. (Fig. C)
- Reconnect all cables (connectors) that have been disconnected.
  Be sure to use the extension cable for servicing for the following section.
  DSP P.C.B. CB2 – INPUT (6) P.C.B. CB909:
  MF117350 (17P 350mm)
  INPUT (6) P.C.B. CB600 – OPERATION (6) P.C.B. CB913:
  MF124500 (24P 500mm)
  INPUT (6) P.C.B. W600 – POWER (3) P.C.B. CB14:
  MF405400 (5P 400mm)
- When connecting the flat cable, use care for the polarity.

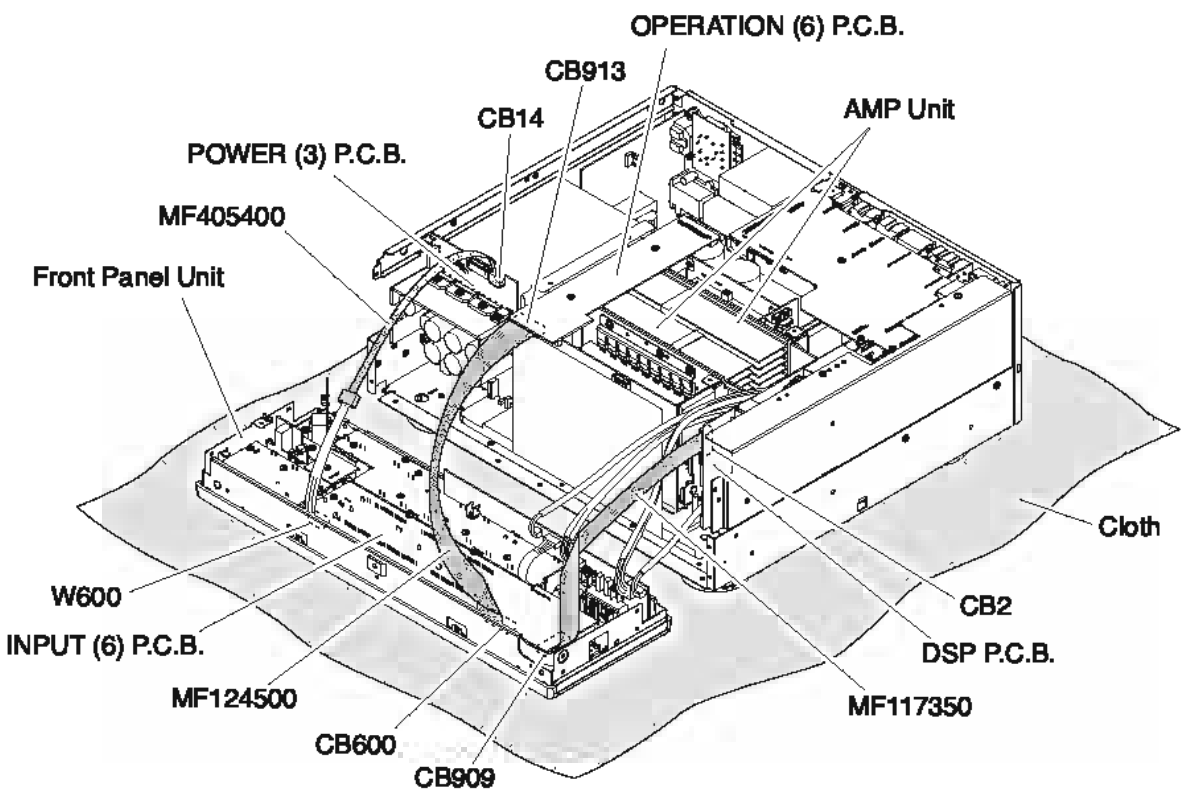


Fig. C

■ UPDATING FIRMWARE

When replacing the following parts, be sure to write the updated data of the firmware.

IC301 of P.C.B. ASS'Y FUNCTION : X6909A00
... Writing of MAIN
IC507 of P.C.B. ASS'Y D-VIDEO : X7220A00
... Writing of VIDEO
IC542 of P.C.B. ASS'Y DSP : X7016A00
... Writing of DSP

● Required tools

- DOS/V machine, OS: Windows 98/2000/Me/XP, PC with a serial port (RS232C)
- Program upgrading program
  DSP_FLASHER_Vx600.exe
- Firmware
  * Be sure to put following 3 firmwares in the same folder.
  MAIN V16Mxxxx.mot
  VIDEO V16Vxxxx.mot
  DSP ..... Vx600_verX_XX_0xXXXXXXXX.hex

- RS232C cross cable "D-sub 9 pin female"
  (Specifications)

Pin No.2 RxD	Pin No.2 RxD
Pin No.3 TxD	Pin No.3 TxD
Pin No.5 GND	Pin No.5 GND
Pin No.7 RTS	Pin No.7 RTS
Pin No.8 CTS	Pin No.8 CTS

● Preparation and precautions before starting the operation

- Download DSP_FLASHER_Vx600.exe from the specified source to the PC being used.
- Prepare the above specified RS232C cross cable.
- While writing, keep the other application software on the PC closed. It is also recommended to keep the software on the task tray closed as well.

● Operation Procedure

Writing of MAIN or VIDEO

1. Install DSP_FLASHER_Vx600.exe into the PC.
2. Connect the RS232C terminal of the main unit to the PC's RS232C terminal with the RS232C cross cable. (Fig. 1)

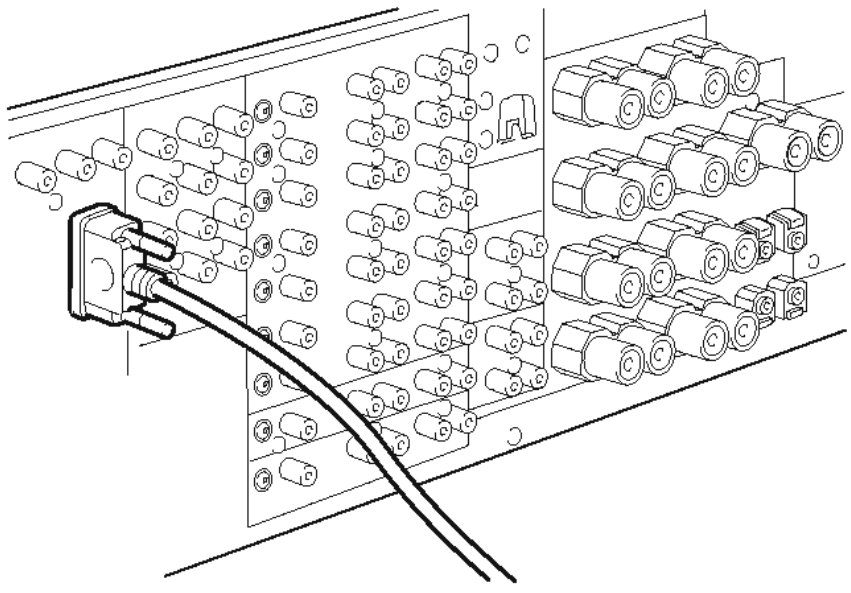
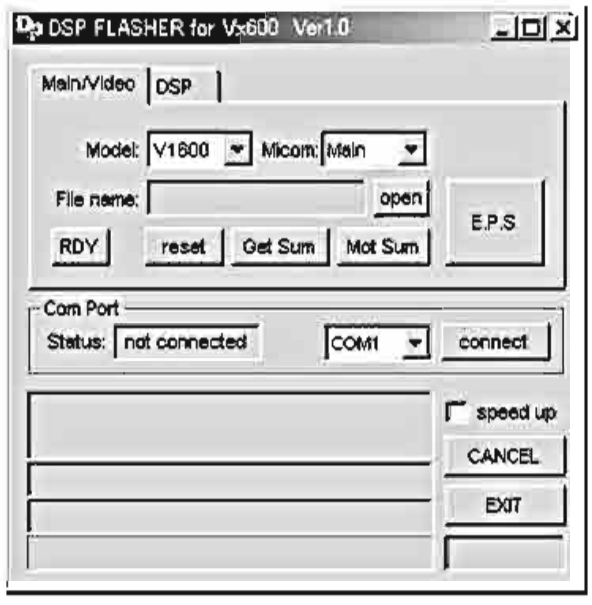
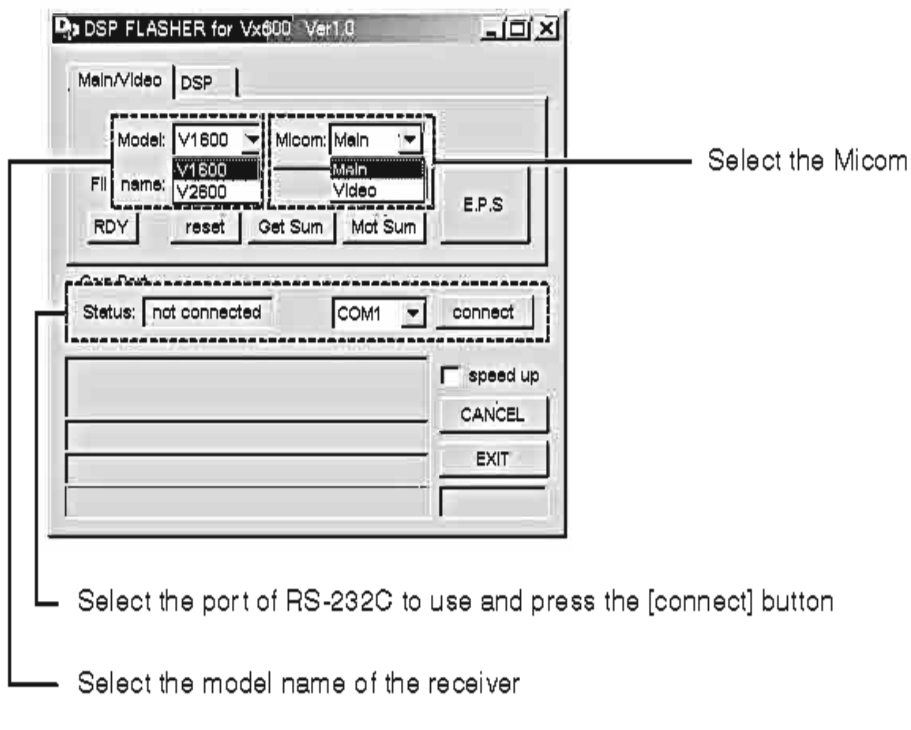


Fig. 1

3. Start up DSP_FLASHER_Vx600.exe.
   Then the screen shown below is displayed.



4. Select the model name of the receiver, the Micom, Com Port and File name.
   - **Model**
     Select "V1600".
   - **Micom**
     Writing of MAIN : Select "Main".
     Writing of VIDEO : Select "Video"
   - **Com Port**
     Select the port of RS-232C to use and press the [connect] button.
     (Com Port Status changes to "connected")
   - **File name**
     Writing of MAIN : Select "V16Mxxxx.mot".
     Writing of VIDEO : Select "V16Vxxxx.mot"



5. Connect the power cable of main unit to the AC outlet. While pressing the "PRESET/TUNING ⊳" key and "A/B/C/D/E" key of the main unit, press the "MASTER ON/OFF" key to activate the DIAG function.

   a. Using the "PROGRAM" knob of the main unit, select the DIAG menu in the figure below.

   ```
   24.FLASH 232C
   MAIN
   ```

   b. Using the "PRESET/TUNING ⊳" key of the main unit, select the DIAG sub-menu in the figure below.

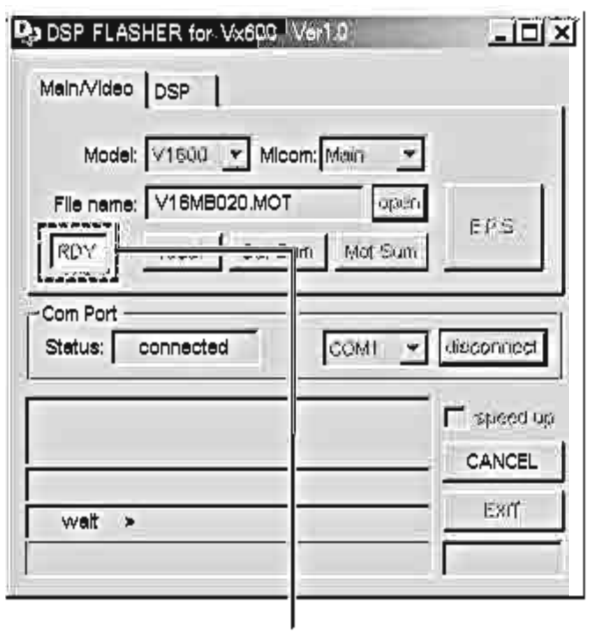
   • Writing of MAIN

   ```
   24.FLASH 232C
   MAIN
   ```

   • Writing of VIDEO

   ```
   24.FLASH 232C
   VIDEO
   ```

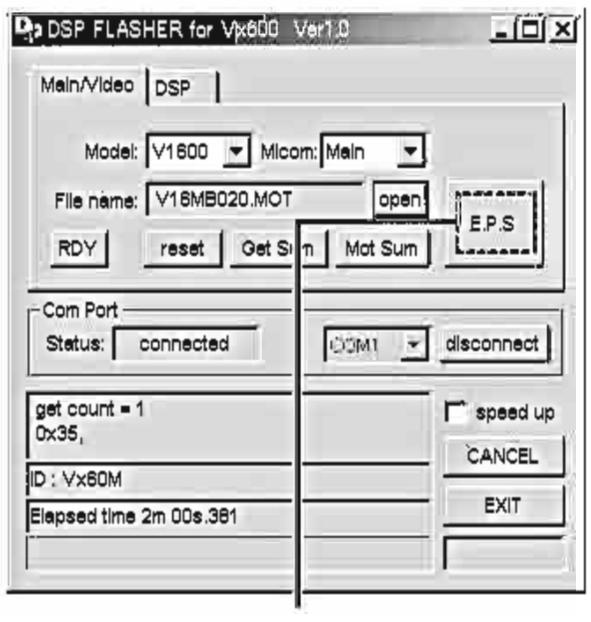
6. Press the [RDY] button.



Press this button

7. Press the "STRAIGHT" key of the main unit.

8. Press the [E.P.S.] button and start writing.



Press this button

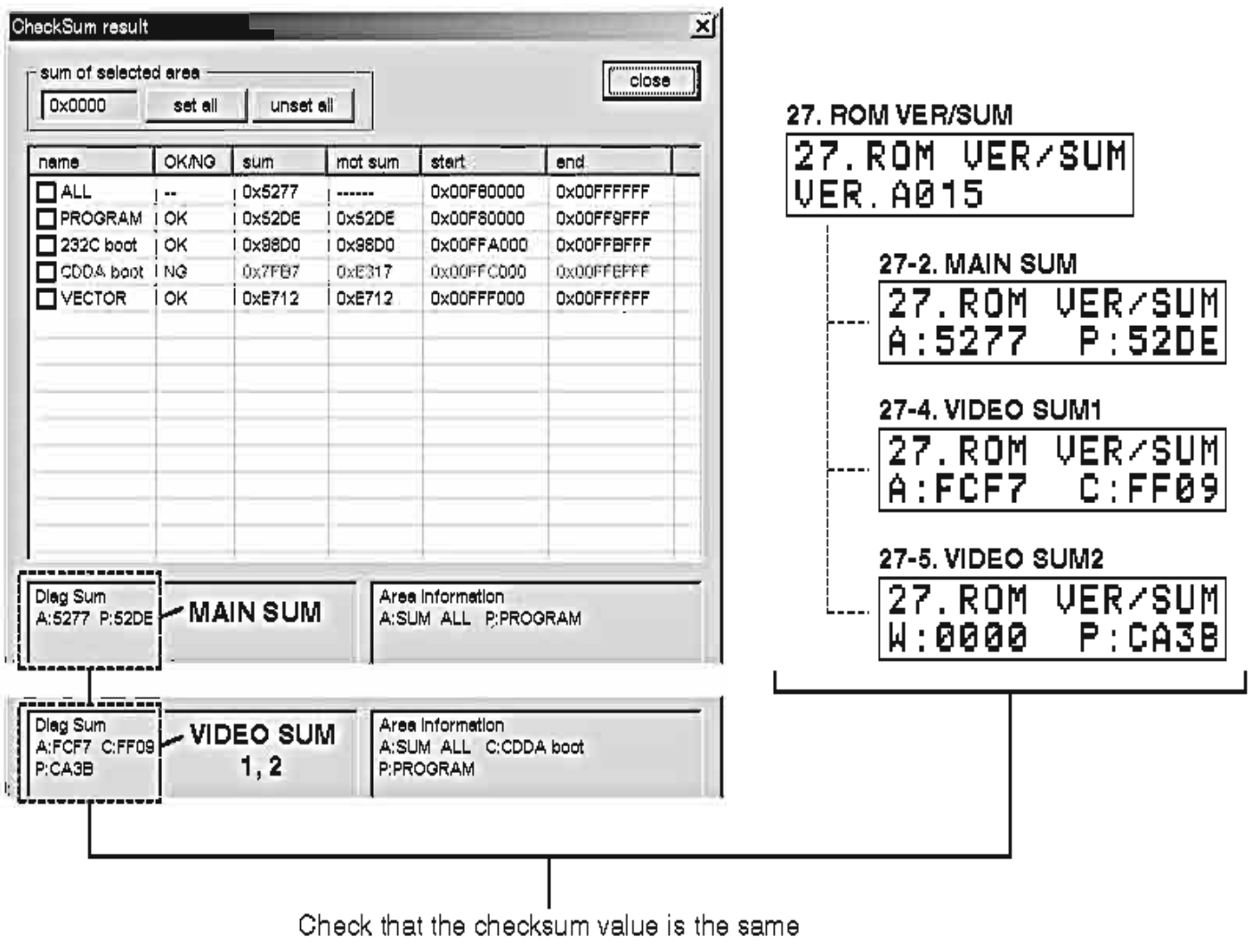
During downloading

9. Check the checksum.
   When writing is completed, the checksum is displayed in the box located at the lower left of “CheckSum result”.

   a. Disconnect the power cable of main unit from the AC outlet.

   b. Connect the power cable of main unit to the AC outlet. Start the DIAG function of the main unit and check that the checksum value is the same.

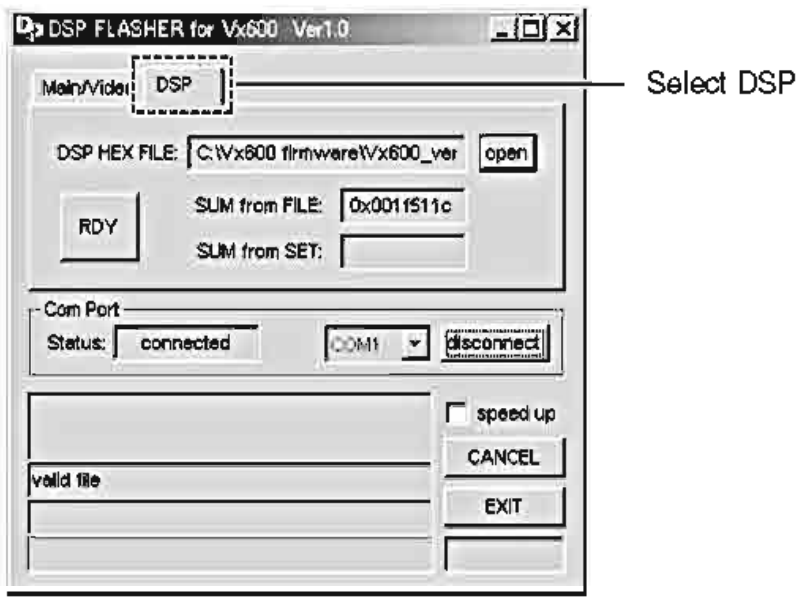
   The procedure is completed when the same version as shown below is obtained.



* If there is a difference, perform the procedure again starting from step “3.Start up DSP_FLASHER_Vx600.exe”.

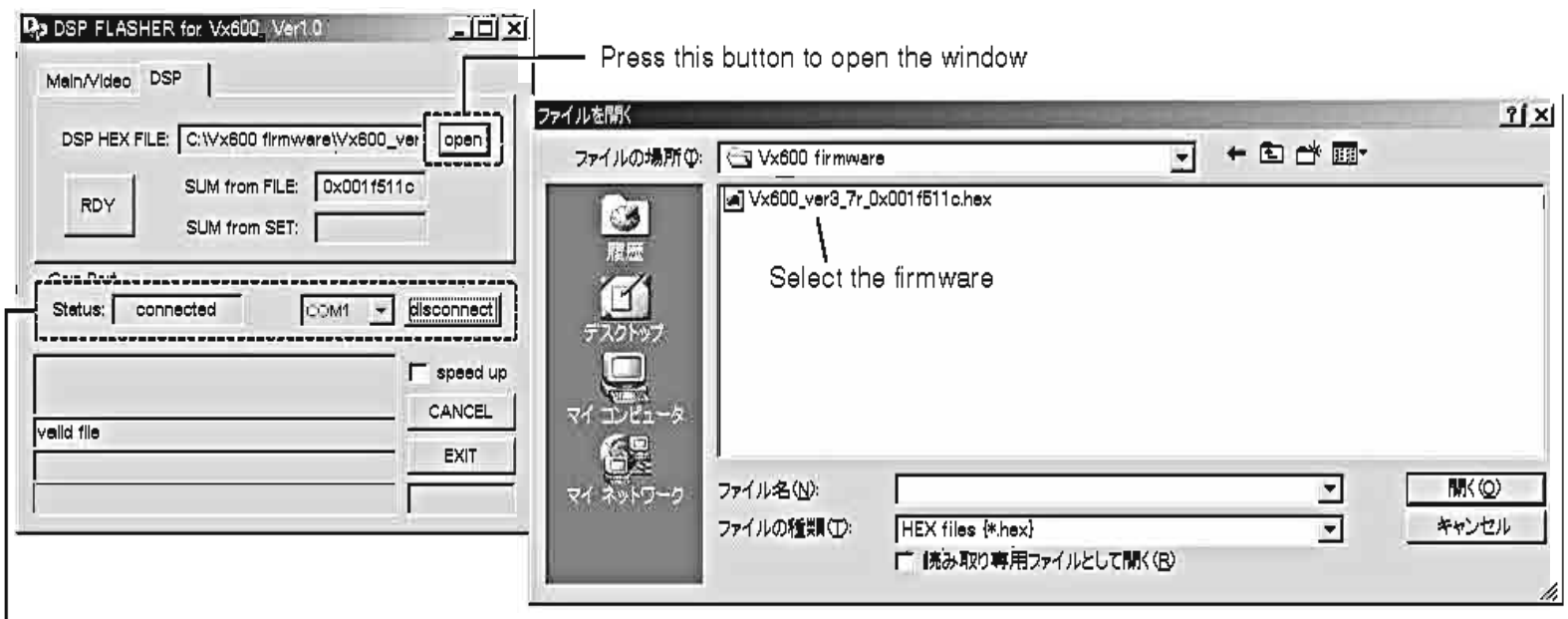
Writing of DSP

1. Install DSP_FLASHER_Vx600.exe into the PC.
2. Connect the RS232C terminal of the main unit to the PC's RS232C terminal with the RS232C cross cable. (Fig. 1)
3. Start up DSP_FLASHER_Vx600.exe.
   Then the screen shown below is displayed.



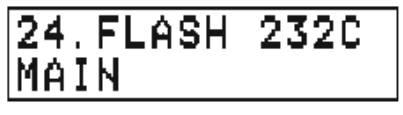
4. Select "DSP" Tag.

5. Select the data to be transmitted and Com Port.
   - **DSP HEX FILE**
     Select "Vx600_verX_XX_0xXXXXXXXX.hex".
   - **Com Port**
     Select the port of RS-232C to use and press the [connect] button.
     (Com Port Status changes to "connected")

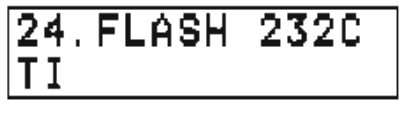


6. Connect the power cable of main unit to the AC outlet. While pressing the "PRESET/TUNING ▻" key and "A/B/C/D/E" key of the main unit, press the "MASTER ON/OFF" key to activate the DIAG function.

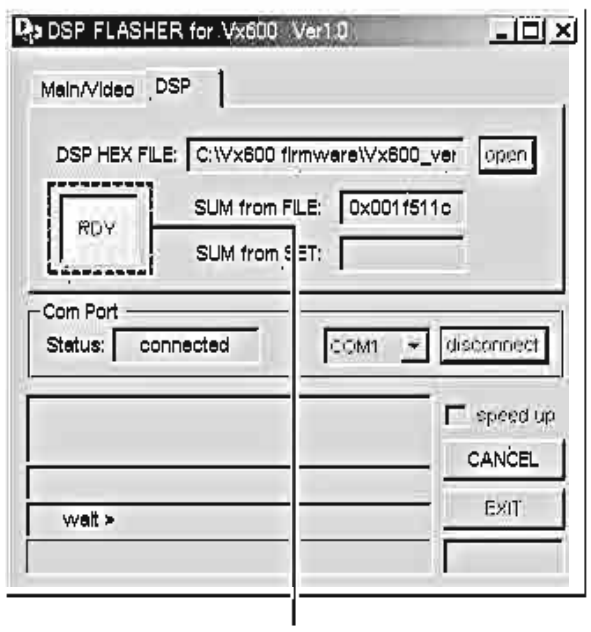
   a. Using the "PROGRAM" knob of the main unit, select the DIAG menu in the figure below.



   b. Using the "PRESET/TUNING ▻" key of the main unit, select the DIAG sub-menu in the figure below.

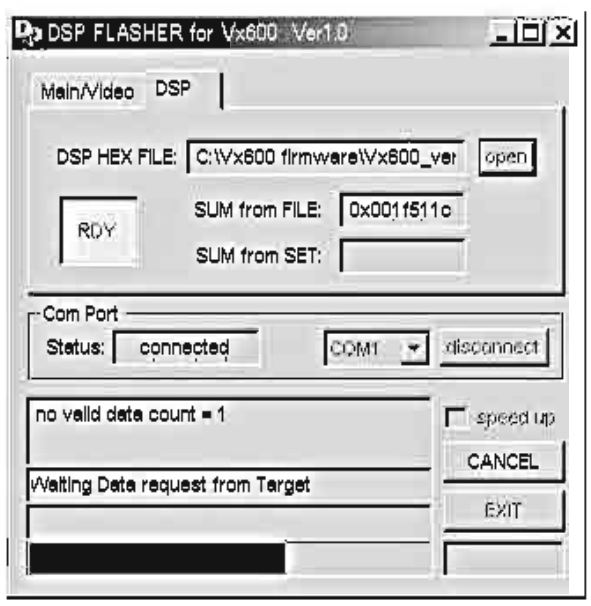


7. Press the [RDY] button.



Press this button

8. Press the "STRAIGHT" key of the main unit.
   The writing function starts.

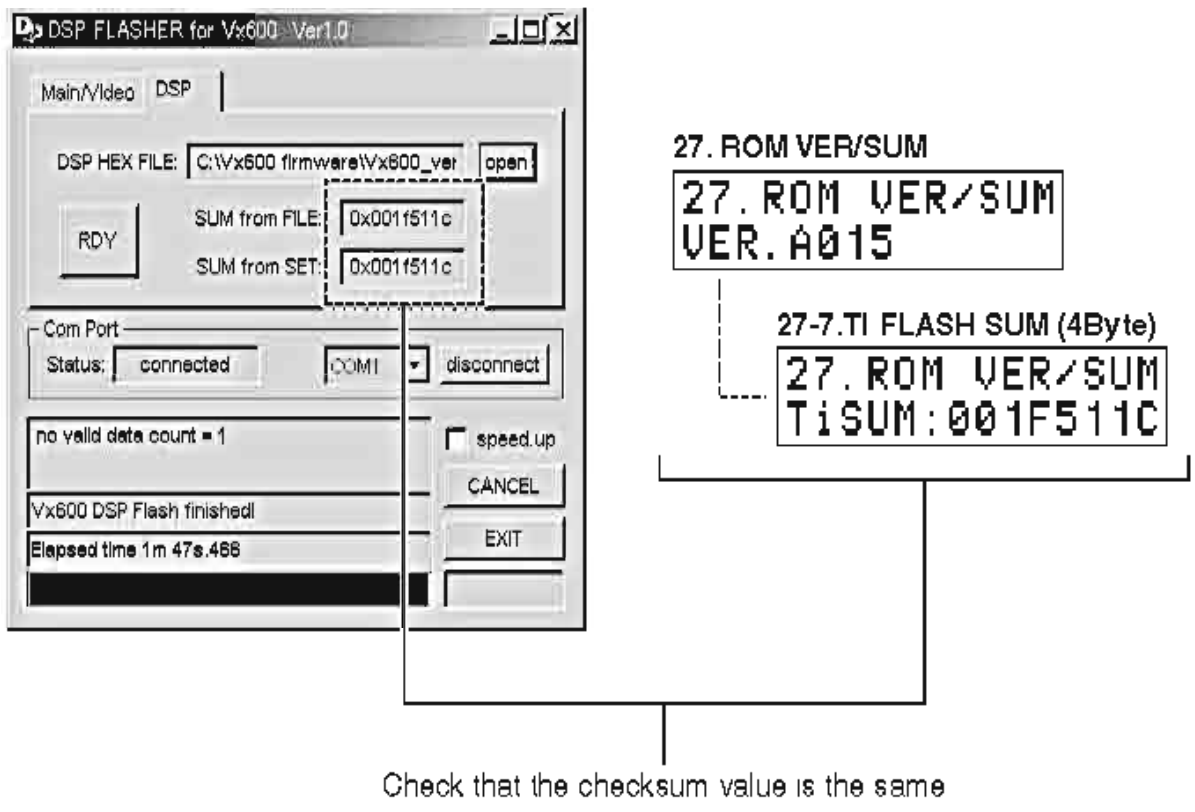


During downloading

* When writing is completed, the power to the main unit is automatically turned OFF/ON.

9. Check the checksum.
   After downloading successfully, the value of "SUM from SET" Is displayed.
   Start the DIAG function of the main unit and check that the checksum value is the same.

   The procedure is completed when the same version as shown below is obtained.



* If there is a difference, perform the procedure again starting from step "3.Start up DSP_FLASHER_Vx600.exe".

■ SELF DIAGNOSIS FUNCTION (DIAG)

There are 27 DIAG menu items, each of which has sub-menu items. Listed in the table below are menu items and sub-menu items.

No	DIAG MENU		SUB MENU	
1	DA60Y-YSS930	1.DA60Y-YSS930 MARGIN	1. MARGIN	
			2. FULL BIT	
2	BYPASS	2.BYPASS ANALOG BYPASS	1. ANALOG BYPASS	
			2. DSP BYPASS	
3	RAM THROUGH	3.RAM THROUGH MARGIN	1. MARGIN	
			2. FULL BIT	
4	HDMI AUDIO	4. SPDIF	1. SPDIF	
			2. Multi	
			3. DSD	(Not applied to this model.)
			4. DSD Direct	(Not applied to this model.)
5	SPEAKERS SET	5.SPEAKERS SET FRONT:SML 0dB	1. FRONT: SMALL 0dB	
			2. CENTER: NONE	
			3. LFE/B: FRNT	
			4. Pres Mix: 5ch	
			5. FATT1 GAIN	
			6. FATT2 GAIN	
			7. Surr B: MUTE	
			8. Surr L/R: MUTE	
			9. Surr NONE	
			10. ZoneOn Zone Amp Tone: MAX	
			11. ZoneOn Zone Amp Tone: MIN	
6	Multi INPUT	6.Multi INPUT 6ch INPUT_6Ω	1. 6ch INPUT_6 ohms	
			2. 8ch INPUT_6 ohms	
			3. 6ch INPUT_8 ohms	
			4. 8ch INPUT_8 ohms	
			5. TMP TEST	
7	MIC CHECK	7.MIC CHECK --- db	1. MIC CHECK	
8	STRAIGHT DISPLAY CHECK	8.STRAIGHT DISPLAY CHECK	1. STRAIGHT	(Initial display)
			2. VFD DISP OFF	(All segments OFF)
			3. VFD DISP ALL	(All segments ON 100%)
			4. VFD DIMMER	(All segments ON 50%)
			5. CHECK PATTERN	(ON in lattice)
9	MANUAL TEST	9.MANUAL TEST TEST ALL	1. TEST ALL	
			2. TEST FRNT L	
			3. TEST CENTER	
			4. TEST FRNT R	
			5. TEST SURR R	
			6. TEST SB R	
			7. TEST SB L	
			8. TEST SURR L	
			9. TEST PRES L	
			10. TEST PRES R	
			11. TEST LFE	
10	RS-232C	10.RS-232C TX DATA: NG	1. TX DATA	
			2. HARD FLOW	
11	FACTORY PRESET	11.FAC PRESET PRESET INH	1. PRESET INH	(memory initialization inhibited)
			2. PRESET RSRV	(memory initialized)
12	AD DATA CHECK	12.AD CHECK DC:021	1. DC	
			2. PS1/PS2	
			3. TM1/TM2	
			4. RECOUT SEL	(Not applied to this model.)

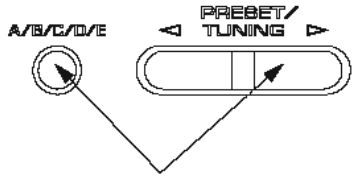
No	DIAG MENU	SUB MENU	
		5. POWER LIMITTER	
		6. LIMIT	
		7. FAN	
		8. MODEL	
		9. DESTINATION	
		10. PANEL KEY (K0/K1)	
13	XM STATUS 13. XM STATUS 1k - 1dB/44	1. 1k -1dB /44.1k	
		2. 1k -61dB /44.1k	
		3. Mute /44.1k	
		4. XM Tone /44.1k	
		5. ISO Tone /44.1k	
		6. 1k -1dB /32k	
		7. 1k -61dB /32k	
		8. Mute /32k	
		9. XM Tone /32k	
		10. ISO Tone /32k	
		11. XM/DT Bus Power: OFF	
14	IF STATUS (Not applied to this model.) 14. IF STATUS IS1:3300020000	1. IS 1	(5Byte)
		2. IS 2	(3Byte)
		3. CS 1	(5Byte)
		4. CS 2	(5Byte)
		5. CS 3	(4Byte)
		6. BS 1	(2Word)
		7. BS 2	(2Word)
		8. BS 3	(2Word)
		9. BS 4	(2Word)
		10. BS 5	(2Word)
		11. BS 6	(2Word)
		12. BS 7	(2Word)
		13. BS 8	(2Word)
		14. BS 9	(2Word)
		15. BS 10	(2Word)
		16. TI 1	(5Byte)
		17. TI 2	(1Byte)
		18. MTT	(5Byte)
15	PROTECTION SETTING (Not applied to this model.) 15. PROTECTION PS_Lo: 0076	1. PS_Lo	
		2. PS_Hi	
		3. DC_Lo	
		4. DC_Hi	
		5. FUN_0	
		6. FUN_1	
		7. FUN_2	
		8. FUN_3	
		9. FUN_4	
		10. FUN_5	
		11. TEMP	
		12. PL_8_M_L	
		13. PL_8_M_H	
		14. PL_8_N_L	
		15. PL_8_N_H	
		16. PL_6_M_L	
		17. PL_6_M_H	
		18. PL_6_N_L	
		19. PL_6_N_H	
16	PROTECTION HIST.	1. LAST:	
		2. HIST1:	

No	DIAG MENU		SUB MENU	
		16.PROTE HIST. LAST:	3. HIST2:	
			4. HIST3:	
17	DSP CHECK	17.DSP CHECK TI BUS:NoEr	1. TI BUS	
			2. YSS-930 BUS	
18	D-VIDEO CHK	18.DVIDEO CHK ALL:OK	1. ALL Check	
			2. Micom/Flash Check	
			3. I2C Read Check	
			4. YGV Bus Check	(Not applied to this model.)
19	HDMI INFO	19.HDMI INFO HMN:HTR-5990	1. HDMI Model Name	
			2. HDMI Product ID	
			3. HDMI Vendor Name	
20	HDMI SELECT	20.HDMI SELECT HDMI NONE	1. HDMI NONE: No Connect	
			2. HDMI IN 1: HDMI IN 1 Port	
			3. HDMI IN 2: HDMI IN 2 Port	
21	HDMI UPCONV	21.HDMI UPCONV HDMI DECODER	1. HDMI Decoder	
			2. HDMI YGV	(Not applied to this model.)
			3. HDMI I/P	
			4. HDMI 720p	(Not applied to this model.)
			5. HDMI 1080i	(Not applied to this model.)
22	VIDEO	22.VIDEO DIGITAL COMP	1. DIGITAL THR COMP	
			2. DIGITAL THR CVBS	
			3. DIGITAL THR Y/C	
			4. DIGITAL BYPASS	
			5. ANALOG BYPASS	
			6. TEST PATTERN 1	
			7. TEST PATTERN 2	
			8. VIDEO INFO	
23	BUS CHECK (Not applied to this model.)	23.BUS CHECK TI FLASH R	1. TI FLASH READ	
			2. TI FLASH WRITE	
			3. TI SDRAM READ	
			4. TI SDRAM WRITE	
			5. YGV READ	
			6. YGV WRITE	
24	FLASH 232C	24.FLASH 232C MAIN	1. MAIN	
			2. VIDEO	
			3. TI	
25	SET INFO	25.SET INFO MODEL:5990	1. MODEL: 5990	
			2. DEST.: J, UC, R, T, K, A, BG, L	
26	SOFT SW	26.SOFT SW SW MODE : PCB	1. SW MODE: PCB/FNC	
			2. VIDEO FORMAT: NTSC/PAL	
			3. AAC EXIST: EXIST/NOT	
			4. CSII EXIST: EXIST/NOT	
			5. RDS EXIST: EXIST/NOT	
			6. XM EXIST: EXIST/NOT	
			7. TMP TEST J/UC/RL	
			8. TMP TEST UCKTABG	
			9. TMP TEST RL	
27	ROM VER/SUM	27.ROM VER/SUM VER.A015	1. MAIN VERSION	
			2. MAIN SUM	
			3. VIDEO VERSION	
			4. VIDEO SUM 1	
			5. VIDEO SUM 2	
			6. TI FLASH VERSION	
			7. TI FLASH SUM	(4Byte)
			8. XM VERSION	

• Starting DIAG

Press the "MASTER ON/OFF" key while simultaneously pressing those two keys of the main unit as indicated in the figure below.

Keys of main unit



Turn on the power while pressing these keys.

• Starting DIAG in the protection cancel mode

If the protection function works and causes hindrance to trouble diagnosis, cancel the protection function as described below, and it will be possible to enter the DIAG mode. (The protection functions other than the excess current detect function will be disabled.)

Press the "MASTER ON/OFF" key while simultaneously pressing those two keys indicated in the figure above. At this time, keep pressing those two keys for 3 seconds or longer.

In this mode, the "SLEEP" segment of the FL display of the main unit flashes to indicate that the mode is DIAG mode with the protection functions disabled.

CAUTION!
Using this product with the protection function disabled may cause damage to itself. Use special care for this point when using this mode.

• Canceling DIAG

① Before canceling DIAG, execute setting for PRESET of DIAG menu No.11 (Memory initialization inhibited or Memory initialized).
* In order to keep the user memory stored, be sure to select PRESET INHIBIT (Memory initialization inhibited). Any protection history will remain in memory.
② Turn off the power by pressing the "MASTER ON/OFF" key of the main unit or the "STANDBY" key of the remote control.

• Display provided when DIAG started

The FL display of the main unit displays the protection function history data and the version (1 alphabet) and the DIAG menu (sub-menu MARGIN of DIAG menu No.1 DA60Y-YSS930) a few seconds later.

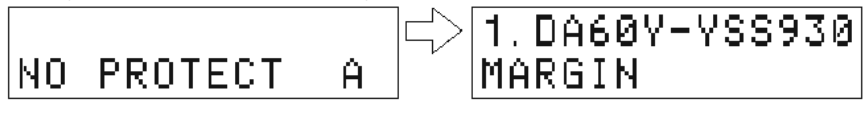
When there is no history of protection function:

Opening message **DIAG menu display**

When there is no history of protection function

Version (1 alphabet)

After a few seconds



When there is a history of protection function:

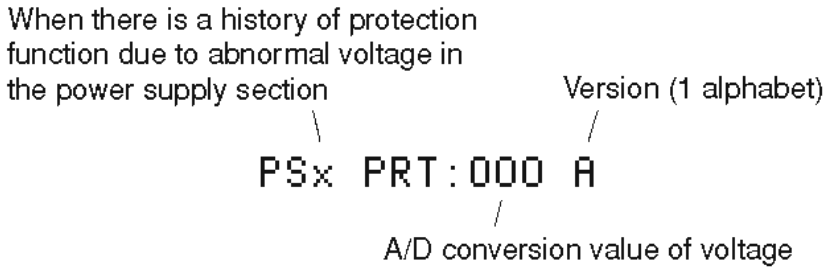
When there is a history of protection function due to excess current

Version (1 alphabet)

Cause: An excessive current flowed through the power amplifier.

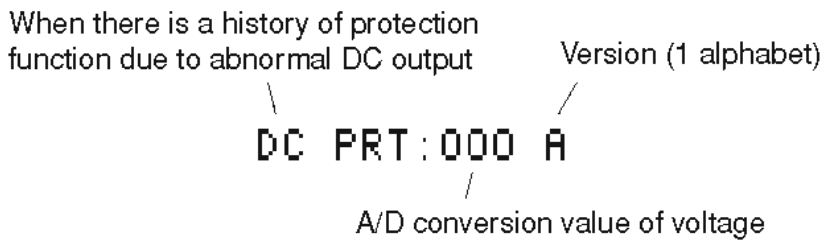
Turning on the power without correcting the abnormality will cause the protection function to work immediately and the power supply will instantly be shut off.

Note)
- Applying the power to a unit without correcting the abnormality can be dangerous and cause additional circuit damage.
- The output transistors in each amplifier channel should be checked for damage before applying any power.
- Amplifier current should be monitored by measuring across the emitter resistors for each channel.



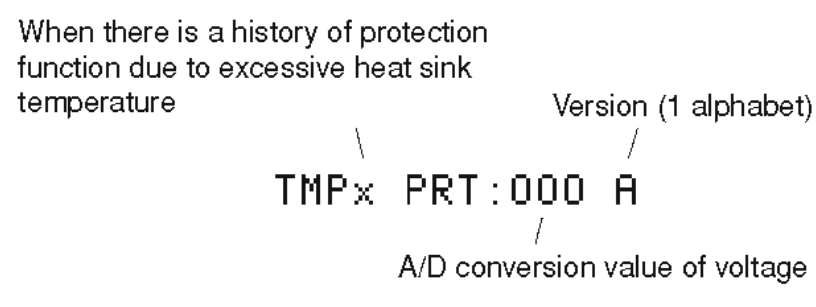
Cause: The voltage in the power supply section is abnormal.
Supplementary information: The abnormal voltage is displayed in based on 5V as 255.

Turning on the power without correcting the abnormality will cause the protection function to work 1 second later and the power supply will be shut off.



Cause: DC output of the power amplifier is abnormal.
Supplementary information: The abnormal voltage is displayed in based on 5V as 255.

Turning on the power without correcting the abnormality will cause the protection function to work 3 seconds later and the power supply will be shut off.



Cause: The temperature of the heat sink is excessive.
Supplementary information: The abnormal voltage is displayed in based on 5V as 255.

Turning on the power without correcting the abnormality will cause the protection function to work 1 second later and the power supply will be shut off.

* Additional causes of protection can be due to loose connections, associated components, CPU, etc.
* For the protection voltage value, refer to DIAG menu No.12 described later.

• History of protection function
When the protection function has worked, its history is stored in memory with a backup. Even if no abnormality is noted while servicing the unit, an abnormality which has occurred previously can be defined as long as the backup data has been stored.
The history of the protection function is cleared when DIAG is cancelled by selecting PRESET RESERVED (Memory initialized) of DIAG menu No. 11 or when the backup data is erased.

• Display during menu operation

During the DIAG mode, the monitor screen shows the wall paper and the function at work among following functions as a short message.

- Input selection, multi channel input
- Muting
- Speaker relay A/B
- Master volume

The FL display of the main unit shows the function at work. The displayed contents are described in the later section on detailed functions.

• Operation procedure of DIAG menu and SUB-MENU

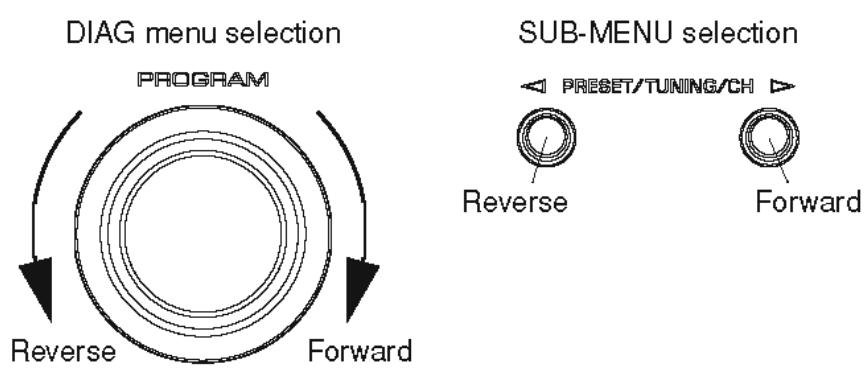
There are 27 MENU items, each of which has some SUB-MENU items.

DIAG menu selection

Select the menu using PROGRAM knob.

SUB-MENU selection

Select the sub-menu using ▷ (Forward) and ◁ (Reverse) keys of PRESET/TUNING.



• Functions in DIAG mode

In addition to the DIAG menu items, functions as listed below are available.

- Input selection, Multi channel input
- Center/Rear/Rear center/Sub-woofer level adjustment
- Muting
- Speaker relay A/B
- Power on/off
- Master volume

* Functions related to the tuner and the set menu are not available.

* It is possible to confirm Menu No.14 IF STATUS while keeping the signal process (operation status) of each DIAG menu by using the “AUDIO SELECT” key of the main unit.

• Initial settings used to start DIAG

The following initial settings are used when starting DIAG. When DIAG is canceled, these settings are restored to those before starting DIAG.

- Master volume: -20dB
- Input: DVD (MULTI CHANNEL INPUT OFF)
- Effect level: 0dB
- Audio mute: OFF
- Speaker relay A/B: ON
- Speaker setting: LARGE / BASS OUT = BOTH
- DIAG menu: DA60Y-YSS930 (1. MARGIN)

• Details of DIAG menu

With full-bit output specified in some modes, it is possible to execute 0dBFS output without head margin in each channel.

1. DA60Y-YSS930

This function is for YSS930 only. Main DSP of YSS930 is selected for FRONT output.
Using the sub-menu, it is possible to select 0dB output level or full-bit output.

MARGIN

- The signal is output including the head margin.

```
1.DA60Y-YSS930
MARGIN
```

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

FULL BIT

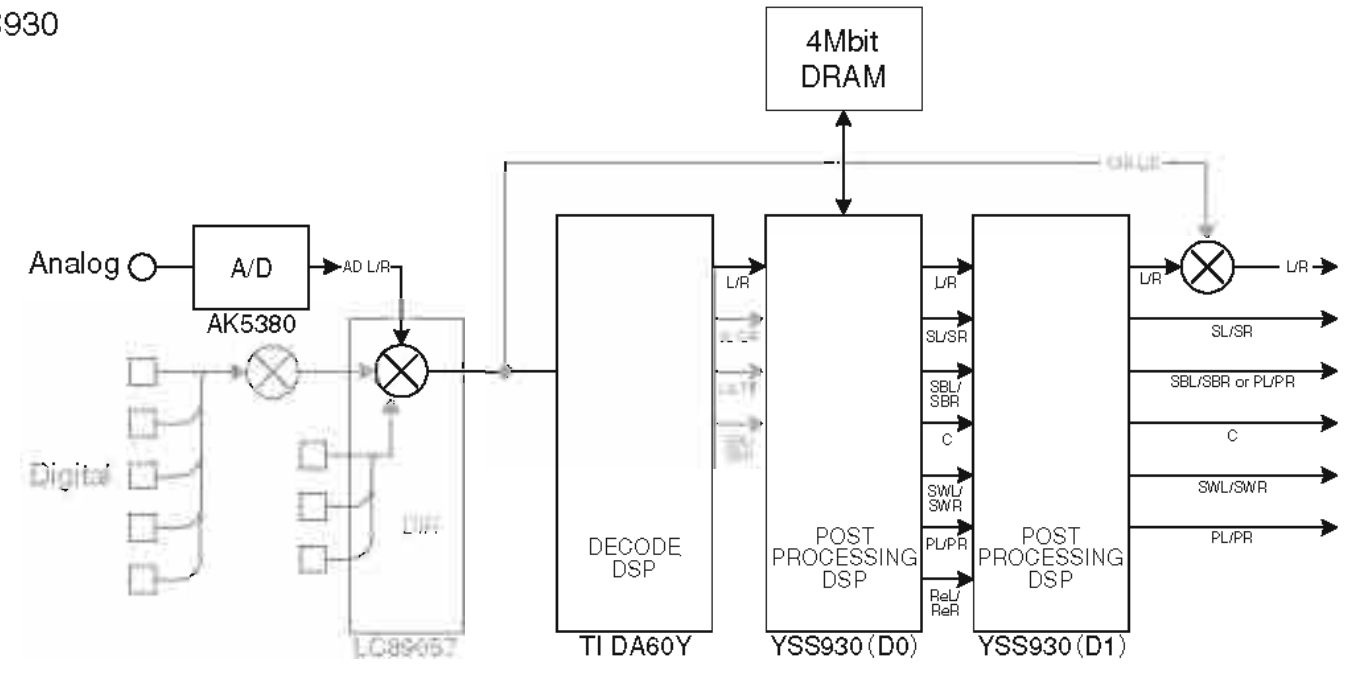
- The signal is output in digital full bit without including the head margin.
- The SWFR signal is output but not in digital full bit.

```
1.DA60Y-YSS930
FULL BIT
```

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

DA60Y-YSS930
(ANALOG)



(Shaded items not used in this example)

2. BYPASS

ANALOG BYPASS

2.BYPASS
ANALOG BYPASS

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	-∞	-∞	-∞	-∞	-∞

DSP BYPASS

2.BYPASS
DSP BYPASS

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	-∞	-∞	-∞	-∞	-∞

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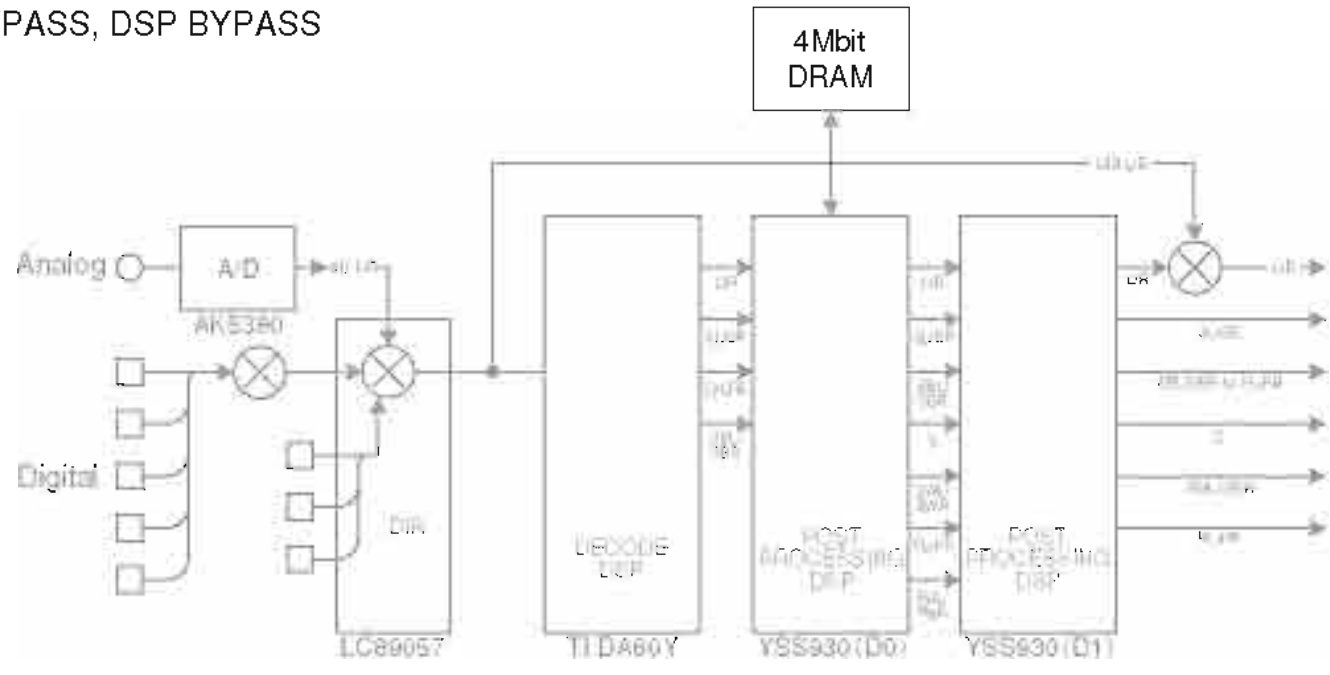
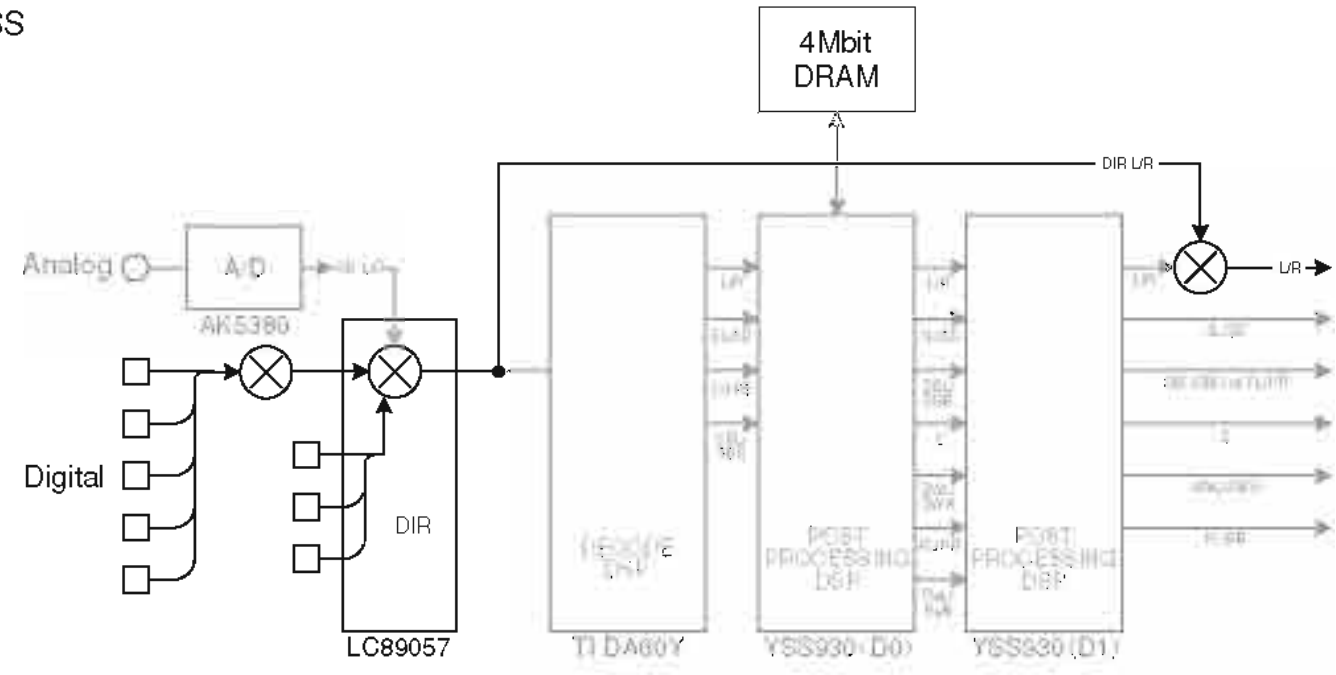
ANALOG BYPASS, DSP BYPASS
(ANALOG)



(Shaded items not used in this example)

DSP BYPASS
(DIGITAL)



(Shaded items not used in this example)

3. RAM THROUGH

Using the sub-menu, it is possible to select the full-bit output at 0dB output level.

MARGIN

```
3.RAM THROUGH
MARGIN
```

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Each ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

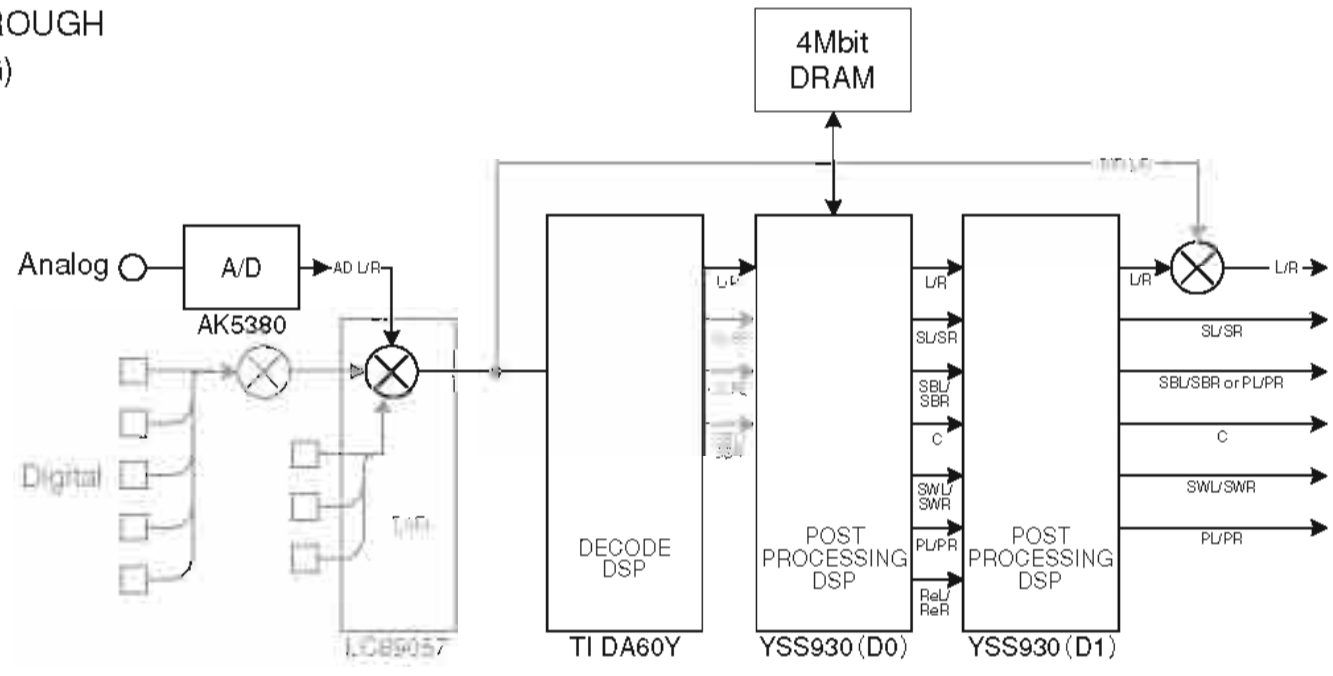
FULL BIT
- MAIN -9dB

3. RAM THROUGH FULL BIT

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

RAM THROUGH
(ANALOG)



(Shaded items not used in this example)

4. HDMI AUDIO

The signals input to HDMI IN1 and IN2 are selected by the sub-menu and output.

SPDIF
Only SPDIF is output.

4. SPDIF

Multi
Only Multi (DVD-AUDIO) is output.

4. Multi

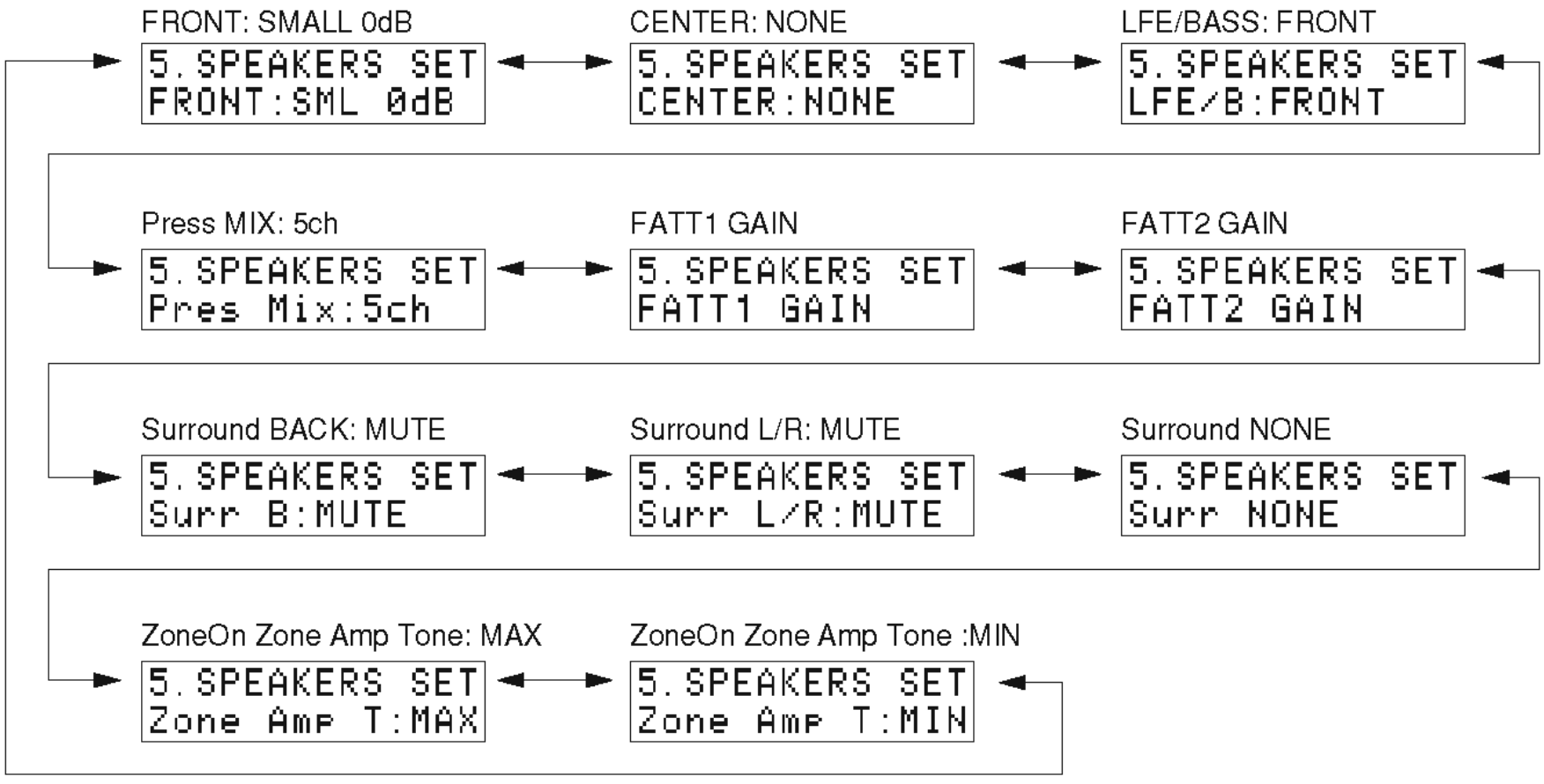
DSD
Not applied to this model.

4. DSD

DSD Direct
Not applied to this model.

5. SPEAKERS SET

The input signal is automatically identified in the order of dts→DOLBY DIGITAL→AAC→PCM→Analog.
There are 11 sub-menu items as follows. The signals output from the DSP block are the same as sub-menu MARGIN of DIAG menu No.1 DA60Y-YSS930.



The analog switch settings for each sub-menu are as shown in the table below.

SUB MENU	FRONT L/R	CENTER	SURROUND L/R	SURROUND BACK L/R	LFE/BASS
1. FRONT: SMALL 0dB	SMALL	LARGE	LARGE	LARGE	SWFR
2. CENTER: NONE	LARGE	NONE	LARGE	LARGE	SWFR
3. LFE/B: FRNT	LARGE	SMALL	SMALL	SMALL	FRONT
4. Pres Mix: 5ch	LARGE	LARGE	LARGE	LARGE	SWFR
5. FATT1 GAIN	LARGE	LARGE	LARGE	LARGE	SWFR
6. FATT2 GAIN	LARGE	LARGE	LARGE	LARGE	SWFR
7. Surr B: MUTE	LARGE	LARGE	LARGE	NONE	SWFR
8. Surr L/R: MUTE	LARGE	LARGE	NONE	LARGE	SWFR
9. Surr NONE	LARGE	LARGE	NONE	NONE	SWFR
10. ZoneOn Zone Amp Tone: MAX	LARGE	LARGE	NONE	NONE	SWFR
11. ZoneOn Zone Amp Tone: MIN	LARGE	LARGE	NONE	NONE	SWFR

LARGE: This mode is used with a speaker with high bass reproduction performance (a large unit). Full bandwidth signals are output.
SMALL: This mode is used with a speaker with low bass reproduction performance (a small unit). The signals of 90Hz or less are mixed into the channel specified by LFE/BASS.
NONE: This mode is used with no center speaker. The center content is reduced by 3dB and distributed to FRONT L/R.
SWFR: LFE of 5.1ch signal or LFE/BASS lower than 90Hz is output through SUBWOOFER OUT.
FRONT: LFE of 5.1ch signal or LFE/BASS lower than 90Hz is distributed to FRONT L/R.

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz
Input level: Both ch, -20 dBm
Volume: +6.5 dB

SUB MENU	SPEAKER OUT					SUBWOOFER OUTPUT
	FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
1. FRONT: SMALL 0dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-2.5 dBm
2. CENTER: NONE	+6.5 dBm	-∞	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm
3. LFE/B: FRNT	+25.0 dBm	+5.0 dBm	+3.5 dBm	+3.5 dBm	-∞	-∞
4. Pres Mix: 5ch	+13.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm
5. FATT1 GAIN	+19.0 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm
6. FATT2 GAIN	+18.5 dBm	+12.5 dBm	-∞	+12.5 dBm	-∞	-6.0 dBm
7. Surr B: MUTE	+18.5 dBm	+12.5 dBm	-∞	-∞	+12.5 dBm	-6.0 dBm
8. Surr L/R: MUTE	+18.5 dBm	+12.5 dBm	-∞	+12.5 dBm	-∞	-6.0 dBm
9. Surr NONE	+13.0 dBm	+12.5 dBm	-∞	-∞	+12.5 dBm	-6.0 dBm
10. ZoneOn Zone Amp Tone: MAX	+18.5 dBm	+12.5 dBm	-∞	-∞	-∞	-6.0 dBm
11. ZoneOn Zone Amp Tone: MIN	+18.5 dBm	+12.5 dBm	-∞	-∞	-∞	-6.0 dBm

6. Multi INPUT

It is possible to select the 6ch/8ch input and 6 ohms/8 ohms by using the SUB menu.

6CH INPUT_6 ohms

```
6.Multi INPUT
6ch INPUT_6Ω
```

INPUT: MULTI CH INPUT
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	-∞	-∞	-6.5 dBm

8CH INPUT_6 ohms

```
6.Multi INPUT
8ch INPUT_6Ω
```

INPUT: MULTI CH INPUT
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	+12.5 dBm	-∞	-6.5 dBm

6CH INPUT_8 ohms

```
6.Multi INPUT
6ch INPUT_8Ω
```

INPUT: MULTI CH INPUT
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	-∞	-∞	-6.5 dBm

8CH INPUT_8 ohms

```
6.Multi INPUT
8ch INPUT_8Ω
```

INPUT: MULTI CH INPUT
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	+12.5 dBm	-∞	-6.5 dBm

TMP TEST

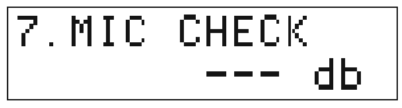
Perform the fan drive test.
Operation is changed using the “STRAIGHT” key.

```
6.Multi INPUT
255000058059 _
```

_: OFF
L: LOW
M: MID
H: HIGH

7. MIC CHECK

The signals inputted through the microphone are output via A/D - D/A.



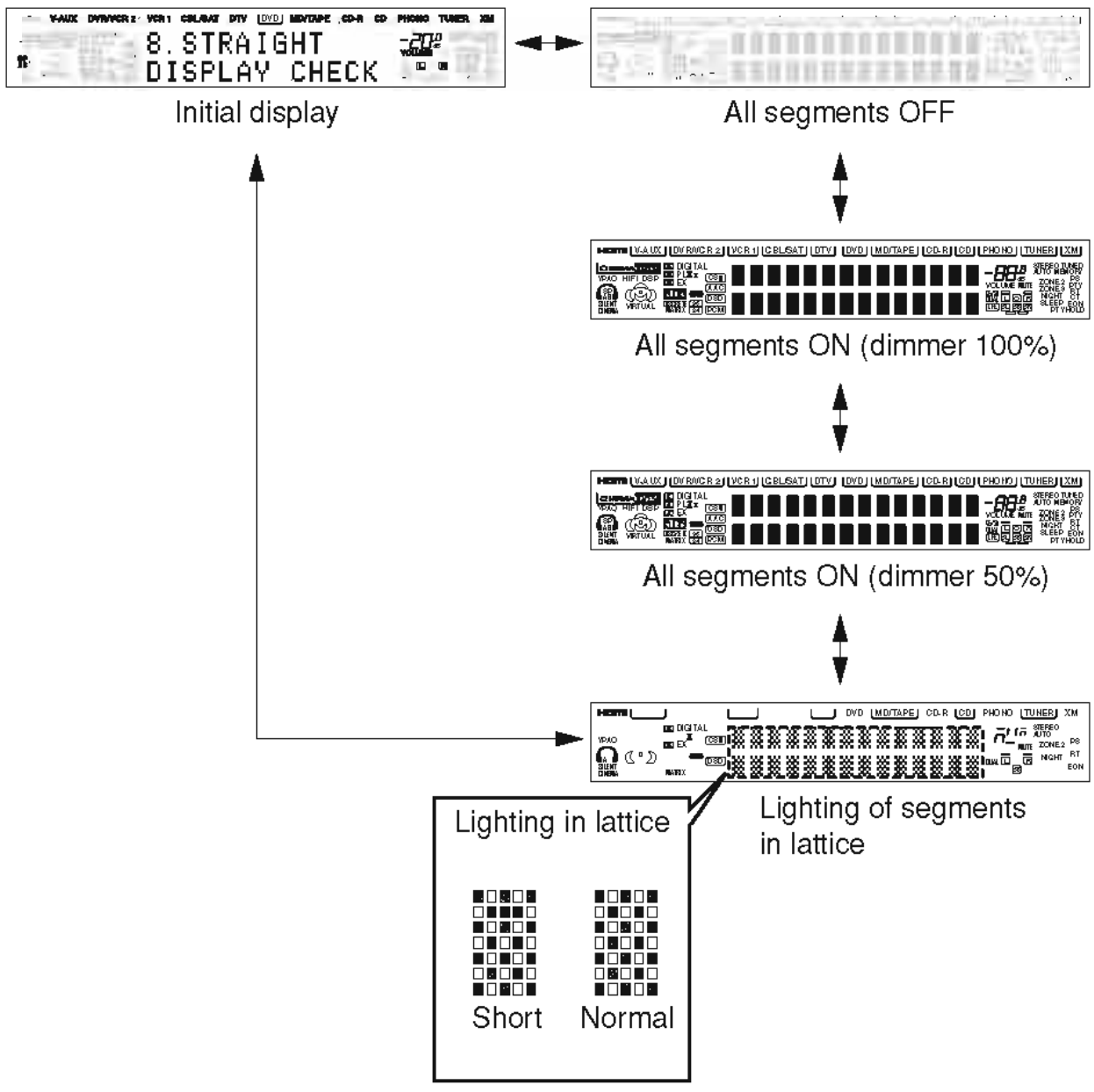
8. STRAIGHT / DISPLAY CHECK

Use this program to check the FL display section and image control section. When checking the image control section, prepare a monitor, component video cable, S video cable and video pin cable and connect them.

Using the sub-menu operation, the display status of the FL display section and image control section varies as shown below.

For audio signal processing, use EFFECT OFF (L/R output by using ANALOG MAIN BYPASS).

Checking FL display section



Segment conditions of the FL driver and the FL tube are checked by turning ON and OFF all segments. Next, the operation of the FL driver is checked by using the dimmer control. Then a short between segments next to each other is checked by turning ON and OFF all segments alternately (in lattice). (In the above example, the segments in the second row from the top are shorted.)

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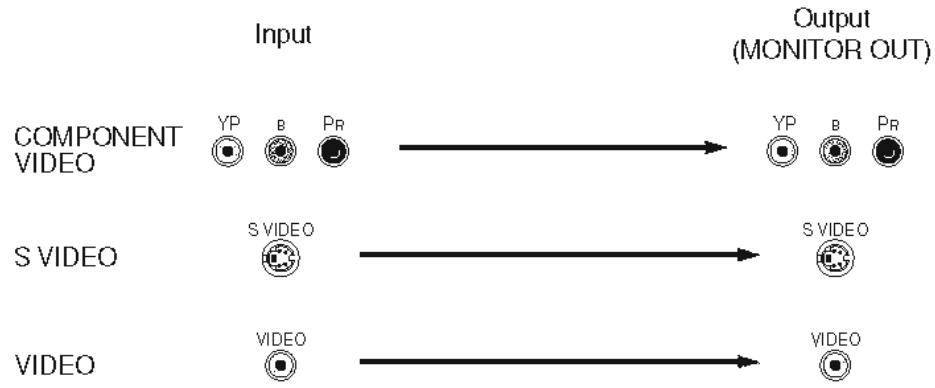
Check of the Video control circuit. (Monitor out)

Initial display/Video conversion OFF — The image signal is output as follows.



Video mute — The image signal is not output.

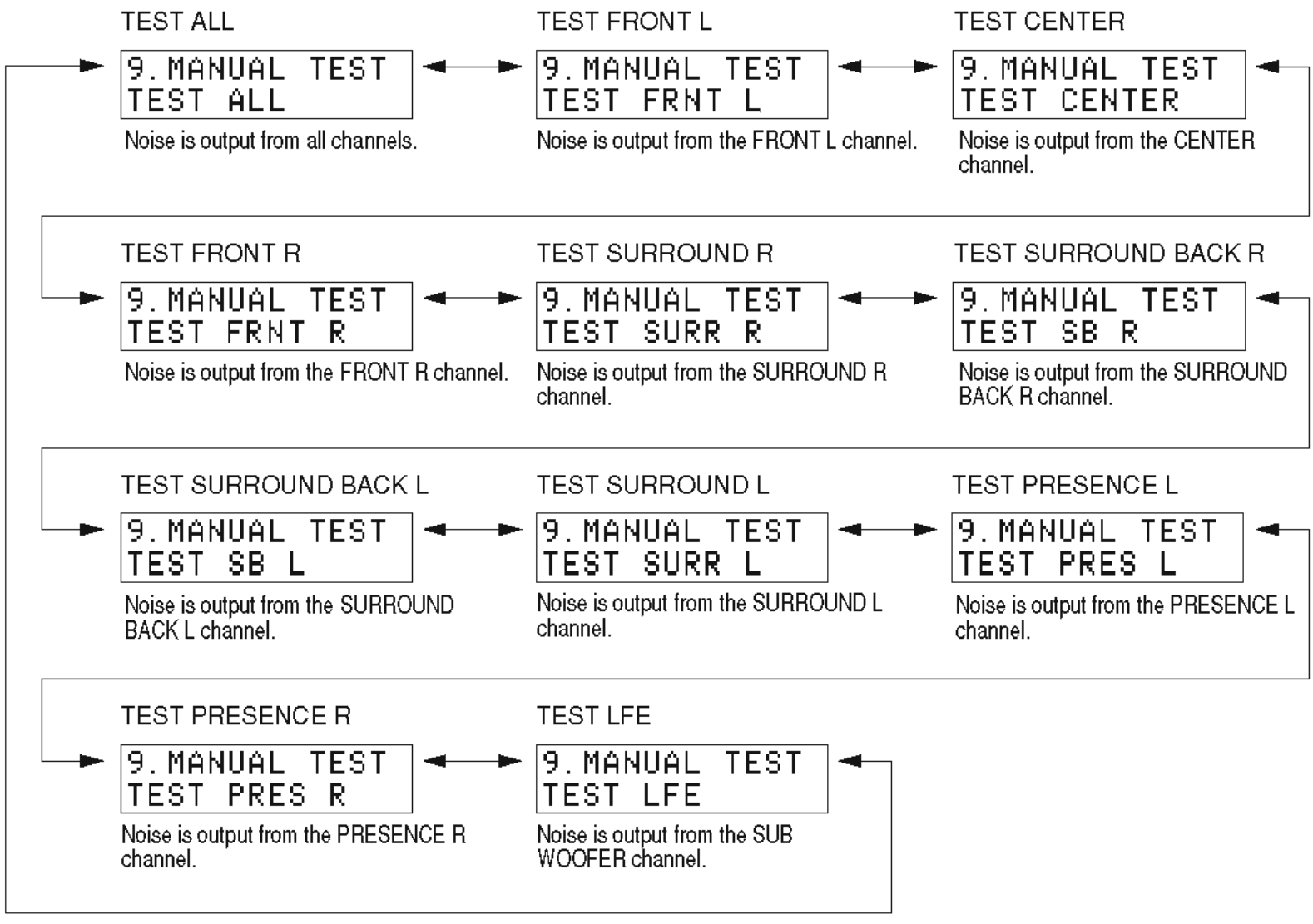
All characters ON — The 128 pictographs for checking the OSD driver are used for the ZONE2 Video output.

Normal operation

Normal operation

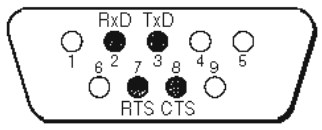
9. MANUAL TEST

The noise generator with a built-in DSP outputs the test noise through the channels specified by the sub-menu.
The noise frequency for LFE is 35 to 250 Hz. Other than that, the center frequency is 800Hz.



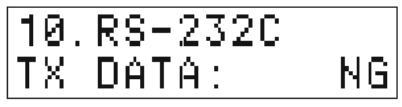
10. RS-232C

This menu is used to check transmission of the data and the flow port of the hardware.
With the power turned off, short between pins No.2 (RxD) and No.3 (TxD), and between pins No.7 (RTS) and No.8 (CTS) of the RS-232C terminal. (Be sure to turn off the power when shorting the pins.)
Start DIAG and select the menu.
There are two sub-menu items.



TX DATA

The sub-menu is used to check transmission of the test data. “OK” appears when the data is transmitted properly and “NG” when it is not.
In this mode, NULL command transmission is continued after the test command is transmitted.

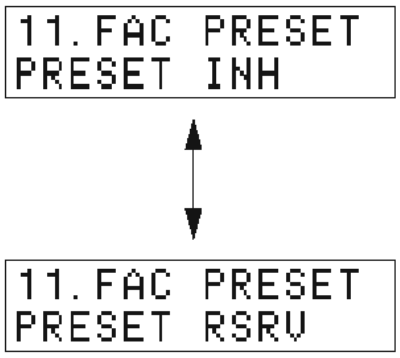


HARD FLOW

This sub-menu is used to check operation of the flow port of the hardware. “OK” appears when the check result is satisfactory and “NG” when it is not.

11. FACTORY PRESET

This menu is used to reserve and inhibit initialization of the back-up RAM. The signals are processed using EFFECT OFF. (The L/R signal is output using ANALOG MAIN BYPASS.)



PRESET INHIBIT (Initialization inhibited)
RAM initialization is not executed. Select this sub-menu to protect the values set by the user.

PRESET RESERVED (Initialization reserved)
Initialization of the back-up RAM is reserved. (Actually, initialization is executed the next time that the power is turned on.) Select this sub-menu to reset to the original factory settings or to reset the RAM. Any protection history will be cleared.

CAUTION: Before setting to the PRESET RESERVED, write down the existing preset memory content of the Tuner in a table as shown below. (This is because setting to the PRESET RESERVED will cause the user memory content to be erased.)

Preset group	P1	P2	P3	P4	P5	P6	P7	P8
A								
B								
C								
D								
E								

• **PRESET STATIONS**

STATION		FM FACTORY PRESET DATA (MHz)
PAGE	NO.	U, C
A/C/E	1	87.5
	2	90.1
	3	95.1
	4	98.1
	5	107.9
	6	88.1
	7	106.1
	8	107.9

STATION		AM FACTORY PRESET DATA (kHz)
PAGE	NO.	U, C
B/D	1	630
	2	1080
	3	1440
	4	530
	5	1710
	6	900
	7	1350
	8	1400

12. AD DATA CHECK

This menu is used to display the A/D conversion value of the main Microprocessor which detects panel keys of the main unit and protection functions in using the sub-menu. During signal processing, the condition before execution is maintained.

When K0/K1 menu is selected, keys become non-operable due to detection of the values of all keys. However, it is possible to advance to the next sub-menu by turning the VOLUME of the main unit. When using this function, note that turning the VOLUME more than 1 click would cause the volume value to change.

* The figures in the diagram are given as reference only.

DC (protection detection)

DC: DC detect protection value (Normal value: 3 to 33)

* If DC is out of the normal value range, the protection function works to turn off the power.
(Reference voltage: 5V=255)

```
12.AD CHECK
DC:021
```

PS1/PS2 (Power supply voltage protection detection)

Power supply voltage protection value (Normal value: PS1: 76 to 106, PS2: 62 to 97)

PS1: Detects ±B1, ±B2, ±B4, ±B5, ±12V, +5D1, +5D2, +5V2, +5V3, +5VBUS and +2.5D.

PS2: Detects +9V, ±5V and +7V.

* If PS is out of the normal value range, the protection function works to turn off the power.
(Reference voltage: 5V=255)

```
12.AD CHECK
PS1:091PS2:079
```

TM1/TM2 (temperature detection)

Temperature detected value
(Normal value: 20 to 182)

TM1: Detects the temperatur of the front heat sink.

TM2: Detects the temperatur of the rear heat sink.
(Reference voltage: 5V=255)

```
12.AD CHECK
TM1:059TM2:060
```

RECOUT SEL (Select position)

Not applied to this model.

```
12.AD CHECK
RECOUT:244
```

POWER LIMITER (Power limiter detection)

Power limiter detection value
The voltage value of pin No. 141 of IC301 is displayed, using 5V/255 as standard.
Based on the input voltage value of pin No. 141 of IC301, the output of pins No. 3 of IC301 is controlled.

```
12.AD CHECK
PLIMIT:000
```

LIMIT

Limiter control value
The voltage at 3 pin of IC301 is displayed with 5V/255 as a standard.

```
12.AD CHECK
LIMIT:255
```

FAN

Fan control value
The voltage at 4 pin of IC301 is displayed with 5V/255 as a standard.

```
12.AD CHECK
FAN:000
```

FUN DRIVE	Value
OFF	0
LOW	184
MID	214
HIGH	255

MODEL

Model detection value
(Reference voltage: 5V=255)

```
12.AD CHECK
MODEL:255
```

MODEL	Value
RX-V2600/DSP-AX2600	0
RX-V1600/DSP-AX1600	124
HTR-5990	255

DESTINATION

Destination detection value
(Reference voltage: 5V=255)

```
12.AD CHECK
DEST:027
```

DESTINATION	Value
J	0
U, C	27
R	81
T	102

DESTINATION	Value
K	127
A	152
B, G	208
L	229

PANEL KEY (K0/K1)

(Panel key of main unit) [Remote control code: –]

A/D of the key fails to function properly when the standard value is deviated by ±8. In this case, check the constant of partial pressure resistor, solder condition, etc. Refer to table 1.

(Reference voltage: 5V=255)

```
12.AD CHECK
K0:255 K1:255
```

[Table 1]

Display	K0	K1
0+4	TONE CONTROL	ZONE CONTROL
26±4	STRAIGHT / EFFECT	A/B/C/D/E
51±4	TUNING MODE	AUDIO SELECT
77±4	MEMORY	SPEAKERS A
104±4	FM/AM	SPEAKERS B
129±4	PRESET/EDIT	PURE DIRECT
154±4	PRESET/TUNING ▷	—
179±4	◁ PRESET/TUNING	—
205±4	—	—
230±4	—	—
255	KEY OFF	KEY OFF

13. XM STATUS

The output check of XM Radio Antenna is executed.

1k -1dB/44.1k

The test tone (1kHz, -1dB/44.1kHz) is output.

```
13.XM STATUS
1k - 1dB/44
```

1k -61dB/44.1k

The test tone (1kHz, -61dB/44.1kHz) is output.

```
13.XM STATUS
1k -61dB/44
```

Mute /44.1k

Nothing is output.

```
13.XM STATUS
Mute    /44
```

XM Tone/44.1k

The XM tone (44.1kHz) is output.

```
13.XM STATUS
XM  Tone/44
```

ISO Tone/44.1k

The ISO tone (44.1kHz) is output.

```
13.XM STATUS
ISO Tone/44
```

1k -1dB/32k

The test tone (1kHz, -1dB/32kHz) is output.

```
13.XM STATUS
1k - 1dB/32
```

1k -61dB/32k

The test tone (1kHz, -61dB/32kHz) is output.

```
13.XM STATUS
1k -61dB/32
```

Mute /32k

Nothing is output.

```
13.XM STATUS
Mute    /32
```

XM Tone/32k

The XM tone (32kHz) is output.

```
13.XM STATUS
XM  Tone/32
```

ISO Tone/32k

The ISO tone (32kHz) is output.

```
13.XM STATUS
ISO Tone/32
```

XM/DT Bus Power: OFF

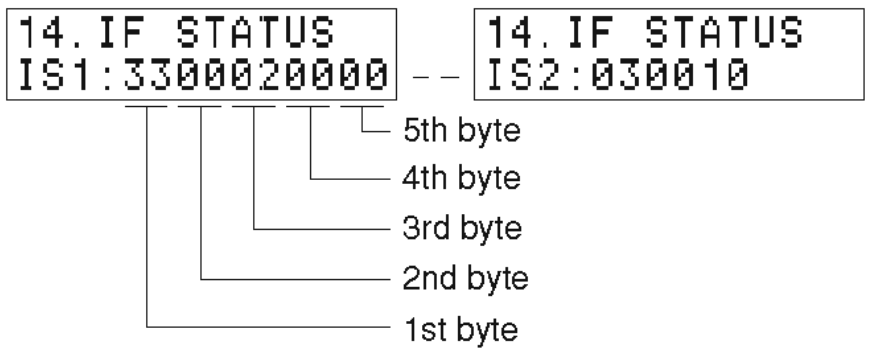
The power of XM module is turned off.

```
13.XM STATUS
Bus Power:OFF
```

14. IF STATUS (Input function status)

Not applied to this model.

IS1, 2 (Inside status)



<1st byte> Digital input/output setting value
Upper 4 bits: REC OUT selected /
lower 4 bits: INPUT selected

Value	Choice	Preset name
0	NONE	
1	OPT A	V-AUX
2	OPT B	CD
3	OPT C	DVD
4	OPT D	D-TV
6	OPT F	CBL/SAT
8	COAX A	CD
9	COAX B	DVD
A	COAX C	DVR/VCR2

<2nd byte> Fs information of reproduction signal

Display	00	01	02	03	04	05	06	0A	0B	0C	0D
Fs (kHz)	Analog	32	44.1	48	64	88.2	96	Unknown NRM	Unknown DBL	Unknown QUAD	Not defined

<3rd byte> Audio code mode information of reproduction signal

Display	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D
Audio Code	1+1	1/0	2/0	3/0	2/1	3/1	2/2	3/2	2/3	3/3	OVER 6.1	MULTI PCE	Unknown	Unknown

<4th byte> Format information of reproduction signal

Display	Signal format
00	Analog (Unlock)
01	Incorrect Digital (*1)
10	PCM Audio
20	Digital Data
21	IEC1937 Data
22	None PCM
23	Unknown
50	dts
51	Red dts
54	dts-ES MATRIX
58	dts-ES DISCRETE
5C	dts-ES (Both flag)
60	AAC
C0	Dolby Digital
C1	D.D. Karaoke
C4	D.D.6.1 (D.D.EX)

*1: Analog processing used for digital reproduction is not possible because of a commercial bit or 4-ch audio reason.

<5th byte> Signal processing status information

*2: With digital signals other than 32kHz, 44.1kHz and 48kHz, through processing method is used for reproducible signals.

bit7	MUTE request	bit3	–
bit6	Red dts flashing	bit2	Through & bypass (*2)
bit5	6.1/EX processing	bit1	–
bit4	FULL MUTE (ON: 1)	bit0	dts analog mute

CS1~3 (Channel status):

```
14.IF STATUS
CS1:FFFFFFFFFF
```
--
```
14.IF STATUS
CS3:FF325400
```

BS1~10:

```
14.IF STATUS
BS1:0000000000
```
--
```
14.IF STATUS
BS10:000000
```

TI1~2:

```
14.IF STATUS
TI1:0808000600
```
--
```
14.IF STATUS
TI2:00
```

MTT:

```
14.IF STATUS
MTT:00180018FF
```

Byte No.	Function
1	Mute condition
2	Factor of the last mute
3	Error count of YSS930-FSCNT
4	Mute count by YSS930-FSCNT
5	Error factor of down load of CS49329

15. PROTECTION SETTING

Not applied to this model.

PS_Lo:

```
15.PROTECTION
PS_Lo:   0076
```

PS_Hi:

```
15.PROTECTION
PS_Hi:   0106
```

DC_Lo:

```
15.PROTECTION
DC_Lo:   0003
```

DC_Hi:

```
15.PROTECTION
DC_Hi:   0033
```

FAN_0~5:

```
15.PROTECTION
FAN_0:   0063
```
--
```
15.PROTECTION
FAN_5:   0069
```

TEMP:

```
15.PROTECTION
TEMP :   0090
```

PL_8_M_L:

```
15.PROTECTION
PL_8_M_L:0160
```
```
15.PROTECTION
PL_6_M_L:0150
```
```
15.PROTECTION
PL_8_M_H:0189
```
```
15.PROTECTION
PL_6_M_H:0180
```
```
15.PROTECTION
PL_8_N_L:0160
```
```
15.PROTECTION
PL_6_N_L:0150
```
```
15.PROTECTION
PL_8_N_H:0189
```
```
15.PROTECTION
PL_6_N_H:0180
```

16. PROTECTION HIST.

The history of protection function is displayed.
After selecting the sub-menu, press the “STRAIGHT” key, and the history will be erased.

Last

```
16.PROTE HIST.
LAST:
```

History1

```
16.PROTE HIST.
HIST1:
```

History2

```
16.PROTE HIST.
HIST2
```

History3

```
16.PROTE HIST.
HIST3:
```

17. DSP CHECK

Whether the bus of DSP P.C.B. is connected properly or not is self-diagnosed.

TI BUS

TI (IC512) data bus check is executed.

```
17.DSP CHECK
TI BUS:NoEr
```

YSS-930 BUS

YSS-930 (IC516, IC518) data bus check is executed.

```
17.DSP CHECK
YSS BUS:NoEr
```

Display	Description
WAIT	Bus is being checked.
NoEr	No error detected.
DATA	Data bus shorted or open.
RSCS	/RAS or /CAS shorted, or open.
ADDR	Address bus shorted or open.

18. D-VIDEO CHECK

Whether the bus of D-VIDEO P.C.B. is connected properly or not is self-diagnosed.

ALL Check

The synthetic judgment result is displayed.

OK : No error detected
NG : An error is detected
No Check : Detection is not executed

```
18.DVIDEO CHK
ALL:OK
```

Microprocessor/Flash Check

The data bus check of Microprocessor (IC501) and Flash (IC507) is executed.

OK : No error detected
NG : An error is detected

```
18.DVIDEO CHK
M:OK  F:OK
```

I2C Read Check

The Line check of I2C is executed.

OK : 0
NG : 1

```
18.DVIDEO CHK
I2C:00000000
```

- Error detection of IC505
- Error detection of IC504
- Error detection of IC503
- Error detection of IC308
- Error detection of IC309
- Error detection of IC310 or IC304
- Error detection of IC310 or IC303

YGV BUS Check

Not applied to this model.

```
18.DVIDEO CHK
YGV:NoError
```

19. HDMI INFORMATION

HDMI Model Name
The model name of this unit written in HDMI module is displayed.

```
19.HDMI INFO
HMN:HTR-5990
```

HDMI Product ID
The product ID of this unit written in HDMI module is displayed.

```
19.HDMI INFO
HPI:3103
```

HDMI Vendor Name
The vendor name (YAMAHA) of this unit written in the HDMI module is displayed.

```
19.HDMI INFO
HVN:YAMAHA
```

20. HDMI SELECT

HDMI NONE: No Connect
Neither HDMI IN 1 terminal nor HDMI IN 2 terminal is selected for input.

```
20.HDMI SELECT
HDMI NONE
```

HDMI IN 1: HDMI IN 1 Port
The HDMI device connected to HDMI IN 1 terminal is selected for input and HDMI is reproduced.
With the audio input terminal selection set to HDMI (Fix), SPDIF or I2S is selected automatically according to the audio format which is used for HDMI input.
Support Audio is set to "others".

```
20.HDMI SELECT
HDMI IN 1
```

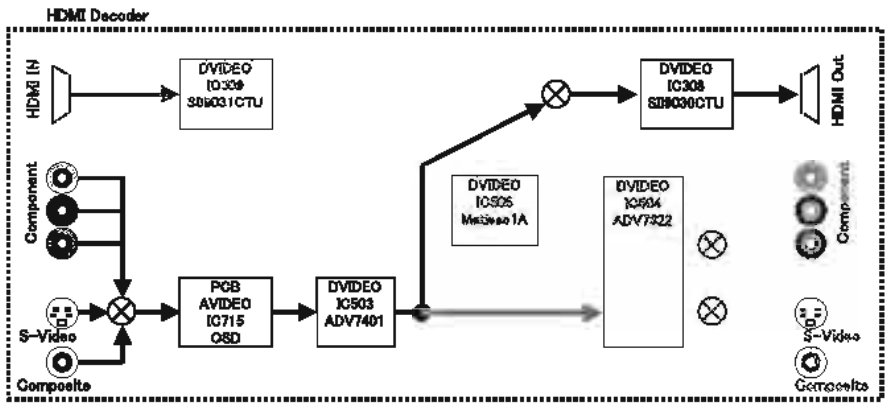
HDMI IN 2: HDMI IN 2 Port
The HDMI device connected to HDMI IN 2 terminal is selected for input and HDMI is reproduced.
With the audio input terminal selection set to HDMI (Fix), SPDIF or I2S is selected automatically according to the audio format which is used for HDMI input.
Support Audio is set to "others".

```
20.HDMI SELECT
HDMI IN 2
```

21. HDMI UPCONV
The image signal to converted and output to HDMI OUT as follows.

HDMI Decoder

```
21.HDMI UPCONV
HDMI DECODER
```

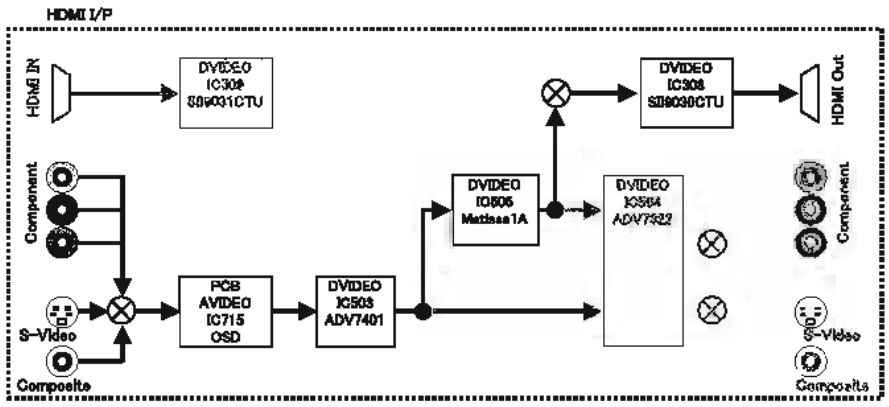


HDMI YGV
Not applied to this model.

```
21.HDMI UPCONV
HDMI YGV
```

HDMI I/P

```
21.HDMI UPCONV
HDMI I/P
```



HDMI 720p
Not applied to this model.

```
21.HDMI UPCONV
*HDMI 720P
```

HDMI 1080i
Not applied to this model.

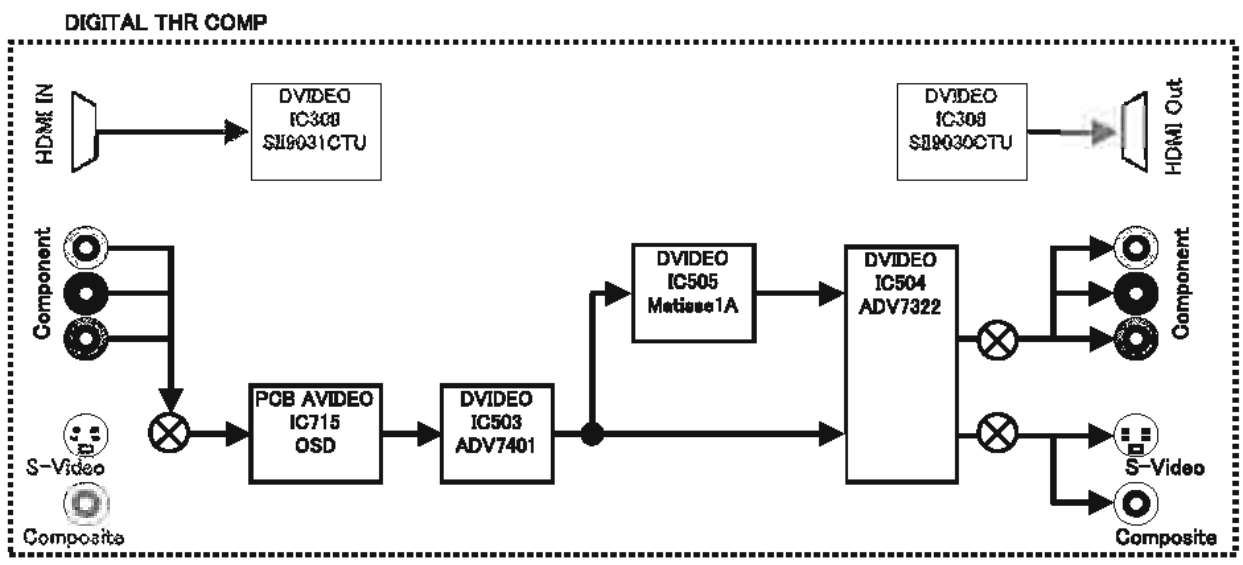
```
21.HDMI UPCONV
*HDMI 1080i
```

22. VIDEO

The image signal to converted and output as follows.

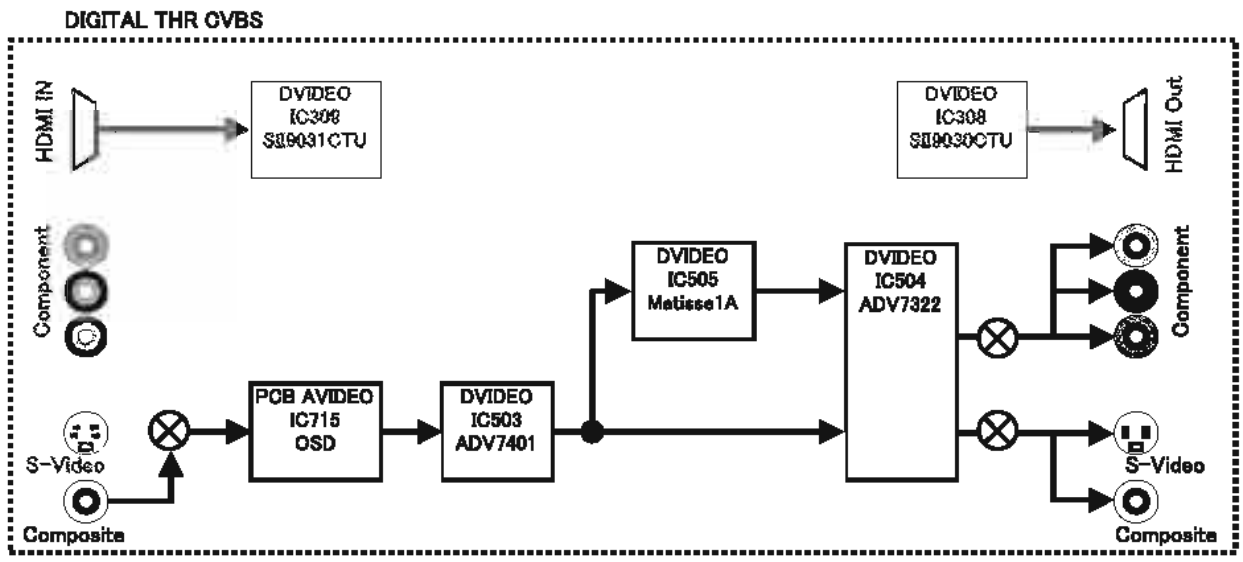
DIGITAL THR COMP

22.VIDEO
DIGITAL COMP



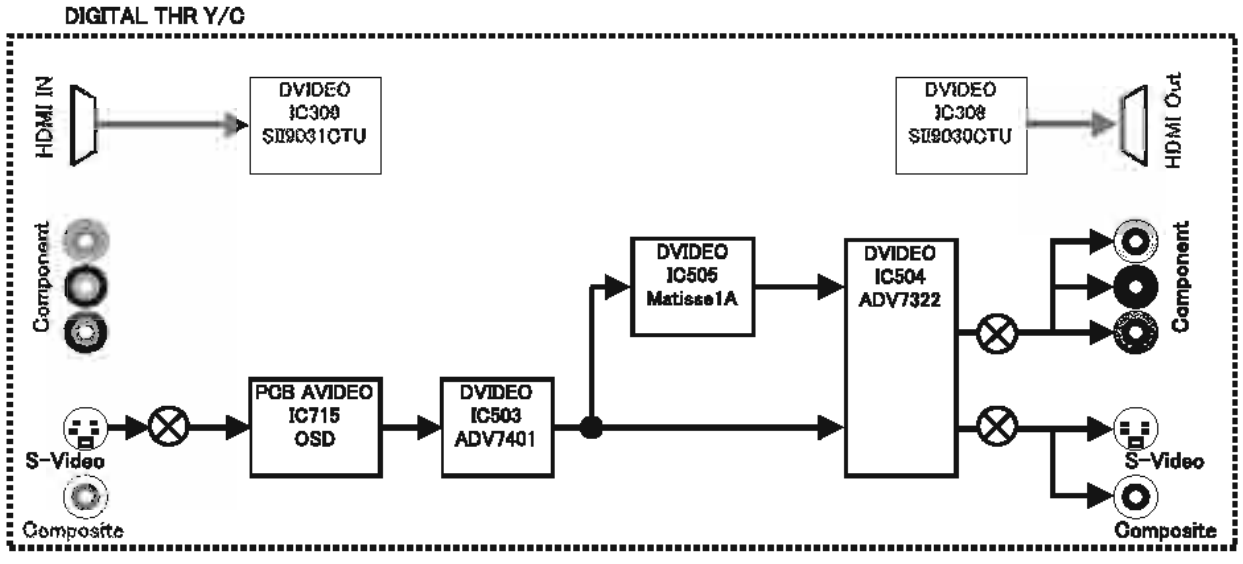
DIGITAL THR CVBS

22.VIDEO
DIGITAL CVBS



DIGITAL THR Y/C

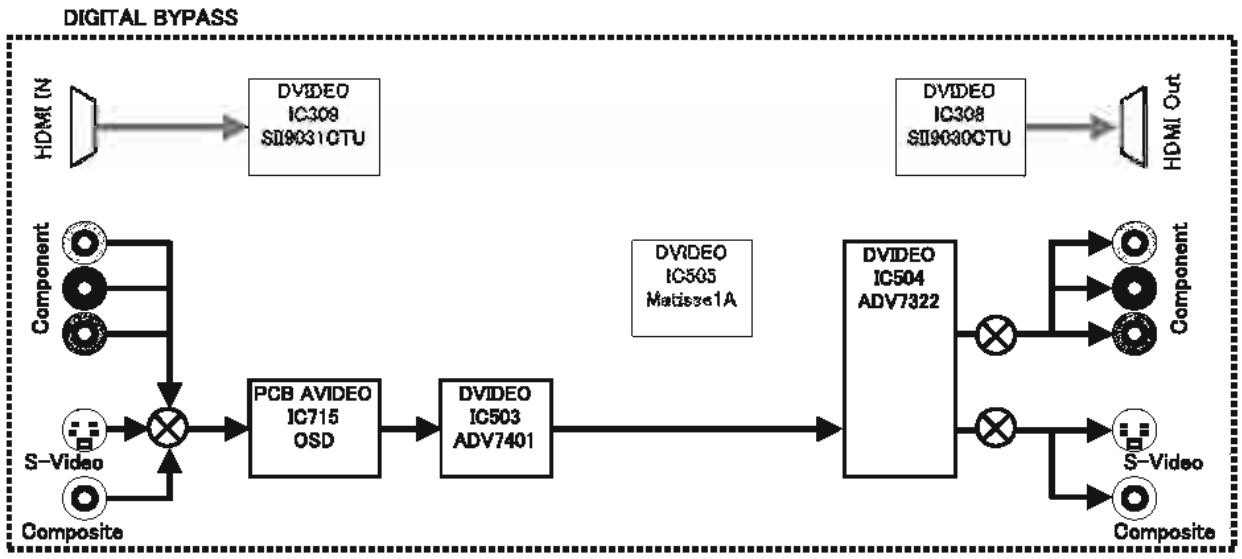
22.VIDEO
DIGITAL Y/C



HTR-5990

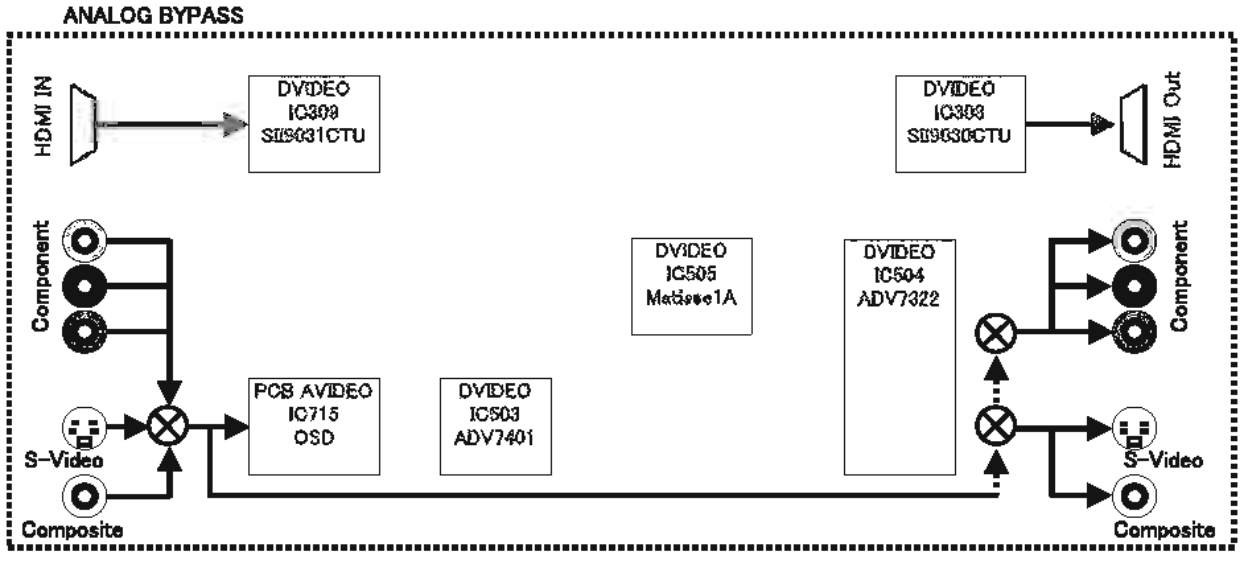
DIGITAL BYPASS

22. VIDEO
DIGITAL BYPASS



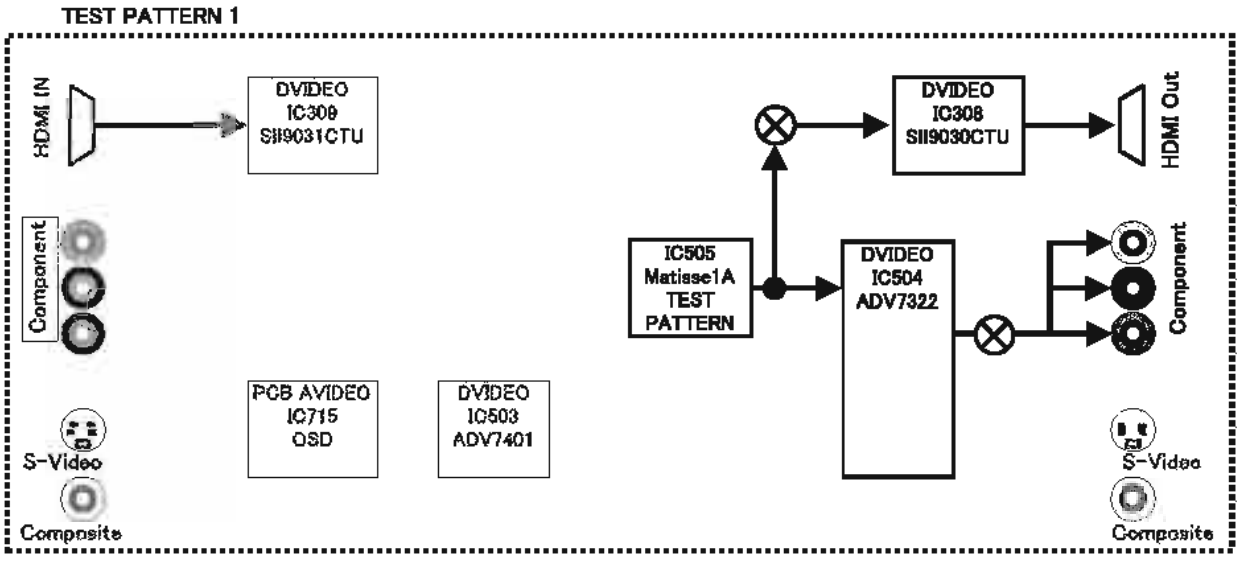
ANALOG BYPASS

22. VIDEO
ANALOG BYPASS

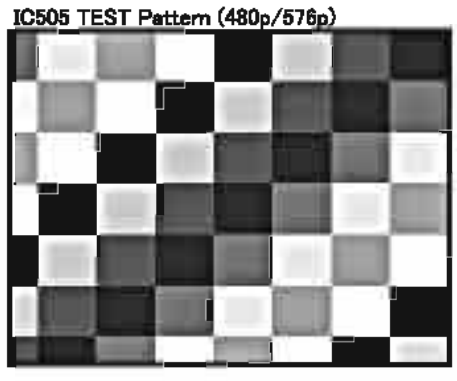


TEST PATTERN 1

22. VIDEO
TEST PATTERN 1

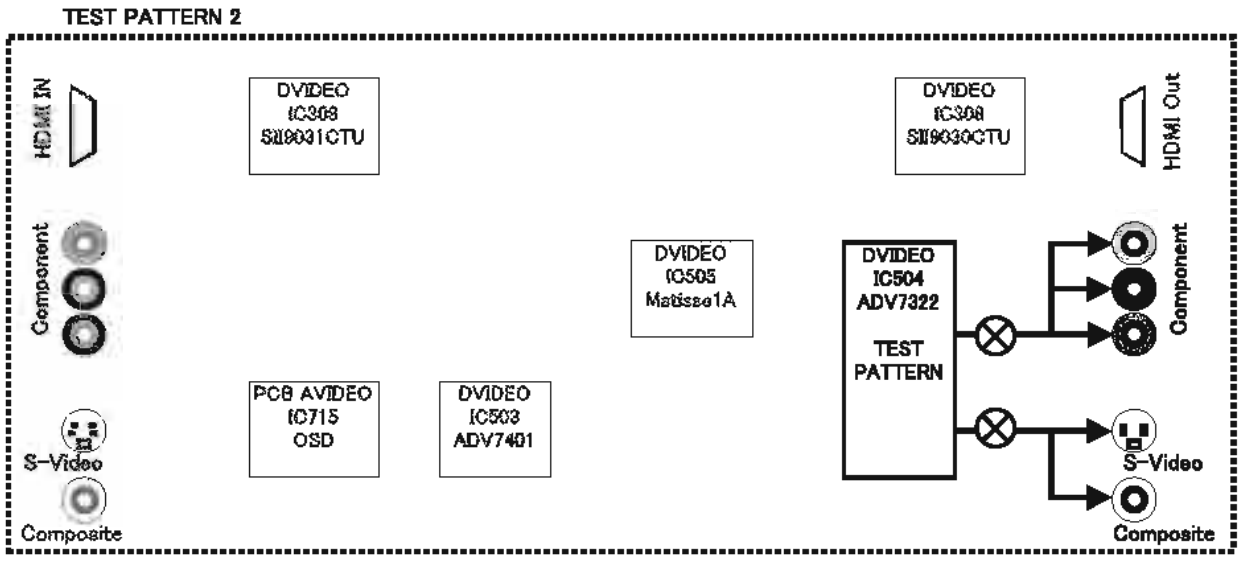


IC505 TEST Pattern (480p/576p)

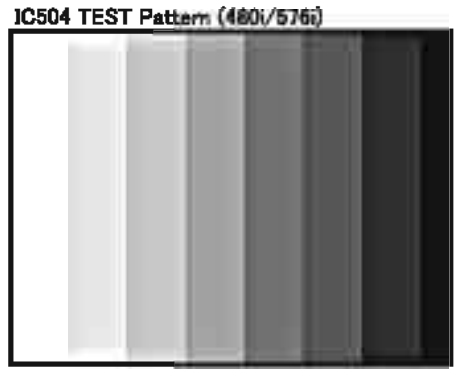


TEST PATTERN 2

22.VIDEO
TEST PATTERN 2



IC504 TEST Pattern (480i/576i)



VIDEO INFO

22.VIDEO
VIDEO INFO

23. BUS CHECK

Not applied to this model.

TI FLASH READ

23.BUS CHECK
TI FLASH R

TI SDRAM WRITE

23.BUS CHECK
TI SDRAM W

TI FLASH WRITE

23.BUS CHECK
TI FLASH W

YGV READ

23.BUS CHECK
YGV BUS R

TI SDRAM READ

23.BUS CHECK
TI SDRAM R

YGV WRITE

23.BUS CHECK
YGV BUS W

24. FLASH 232C

Select this when writing the firmware.

MAIN

Writing of MAIN.

```
24.FLASH 232C
MAIN
```

VIDEO

Writing of VIDEO.

```
24.FLASH 232C
VIDEO
```

TI

Writing of DSP.

```
24.FLASH 232C
TI
```

25. SET INFO

The information on the model and destination is displayed.

MODEL: 5990

```
25.SET INFO
MODEL:5990
```

DEST.: J, UC, R, T, K, A, BG, L

J, UC, R, T, K, A, BG or L is displayed.

```
25.SET INFO
DEST.:J
```

26. SOFT SW

This menu is used to switch the function settings on P.C.B. through the software so as to activate the product.

The protection function follows the P.C.B. settings. When connected to AC or in the maker preset state, the unit is initialized to the P.C.B. setting. Display of each function after initialization varies depending on settings on P.C.B.. The operation mode can be changed by selecting the sub-menu and then using the “STRAIGHT” key.

SW MODE: PCB/SOFT

PCB or SOFT can be selected.

```
26.SOFT SW
SW MODE : PCB
```

VIDEO FORMAT: NTSC/PAL

NTSC or PAL can be selected.

NTSC (U, C, R, K, J models)

PAL (T, A, B, G, L models)

```
26.SOFT SW
TV FORMAT:
```

AAC EXIST: EXIST/NOT

EXIST or NOT can be selected.

EXIST (J model)

NOT (U, C, R, T, K, A, B, G, L models)

```
26.SOFT SW
AAC:NOT
```

CSII EXIST: EXIST/NOT

EXIST or NOT can be selected.

EXIST (J model)

NOT (U, C, R, T, K, A, B, G, L models)

```
26.SOFT SW
CSII:NOT
```

RDS EXIST: EXIST/NOT

EXIST or NOT can be selected.

EXIST (B, G models)

NOT (U, C, R, T, K, A, L, J models)

```
26.SOFT SW
RDS:NOT
```

XM EXIST: EXIST/NOT
EXIST or NOT can be selected.
EXIST (U, C models)
NOT (R, T, K, A, B, G, L, J models)

```
26.SOFT SW
XM:EXIST
```

TMP TEST J/UC/RL
J, UC or RL can be selected.
J (J model)
UC (U, C, T, K, A, B, G models)
RL (R, L models)

```
26.SOFT SW
TMP TEST UC
```

27. ROM VER/SUM

The version and checksum are displayed. The signal is processed using EFFECT OFF. The checksum is obtained by adding the data at every 8 bits for each program area and expressing the result as a 4-figure hexadecimal data.

```
27.ROM VER/SUM
VER.A015
```

MAIN VERSION
The version of MAIN (IC301) FUNCTION P.C.B.) firmware is displayed.

```
27.ROM VER/SUM
A:19D0  P:1A37
```

MAIN SUM
The checksum of MAIN (IC301 FUNCTION P.C.B.) is displayed.
A: All area P: Program area

```
27.ROM VER/SUM
V-VER.B009
```

VIDEO VERSION
The version of VIDEO (IC501 D-VIDEO P.C.B.) firmware is displayed.

```
27.ROM VER/SUM
A:CFA1  C:FF09
```

VIDEO SUM 1
The checksum of VIDEO (IC501 D-VIDEO P.C.B.) is displayed.
A: All area C: CDDA boot area

```
27.ROM VER/SUM
W:0000  P:9CE5
```

VIDEO SUM 2
The checksum of VIDEO (IC501 D-VIDEO P.C.B.) is displayed.
W: Wall paper area (Not applied to this model.)
C: CDDA boot area

```
27.ROM VER/SUM
TI VER.:2.3r
```

TI FLASH VERSION (1Byte)
The version of DSP (IC542 DSP P.C.B.) firmware is displayed.

```
27.ROM VER/SUM
TiSUM:74A696C9
```

TI FLASH SUM (4Byte)
The checksum of DSP (IC542 DSP P.C.B.) is displayed.

```
27.ROM VER/SUM
 XM VER. A001
```

XM VERSION
The version of XM firmware is displayed.

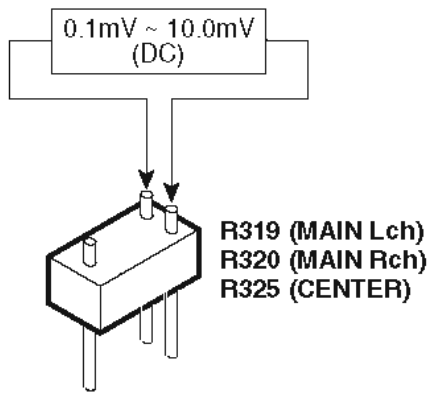
■ AMP ADJUSTMENT

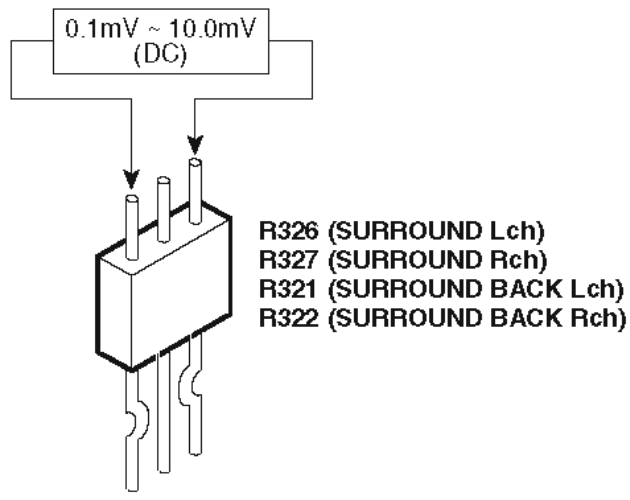
Confirmation of Idling Current of Amp Unit

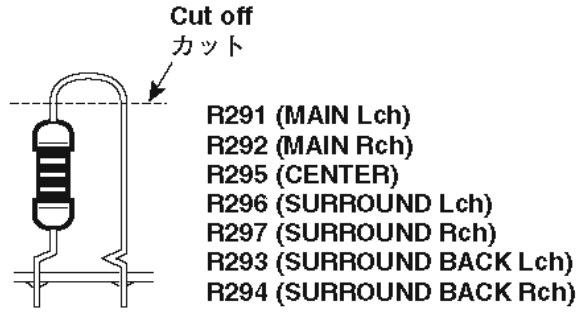
- Right after power is turned on, confirm that the voltage across the terminals of R319 (MAIN Lch), R320 (MAIN Rch), R325 (CENTER), R326 (SURROUND Lch), R327 (SURROUND Rch), R321 (SURROUND BACK Lch), R322 (SURROUND BACK Rch) are between 0.1mV and 10.0mV.
- If it exceeds 10.0mV, open (cutoff) R291 (MAIN Lch), R292 (MAIN Rch), R295 (CENTER), R296 (SURROUND Lch), R297 (SURROUND Rch), R293 (SURROUND BACK Lch), R294 (SURROUND BACK Rch) and reconfirm the voltage.

Attention
If the idle current exceeds 10.0mV after an amplifier repair, first check for a defective component before cutting the bias resistor.

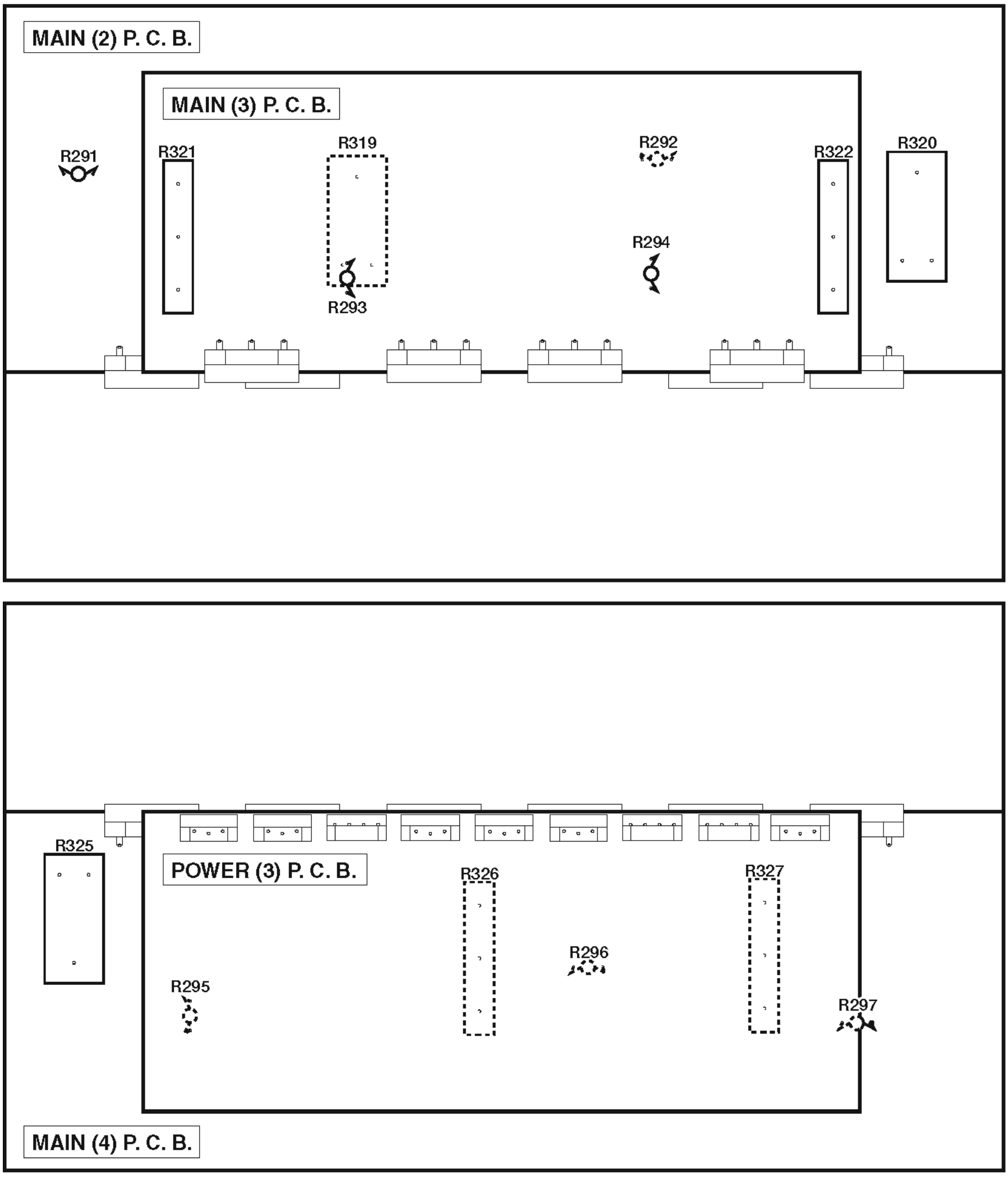
- Confirm that the voltage is 0.2 mV ~ 15.0 mV after 60 minutes.







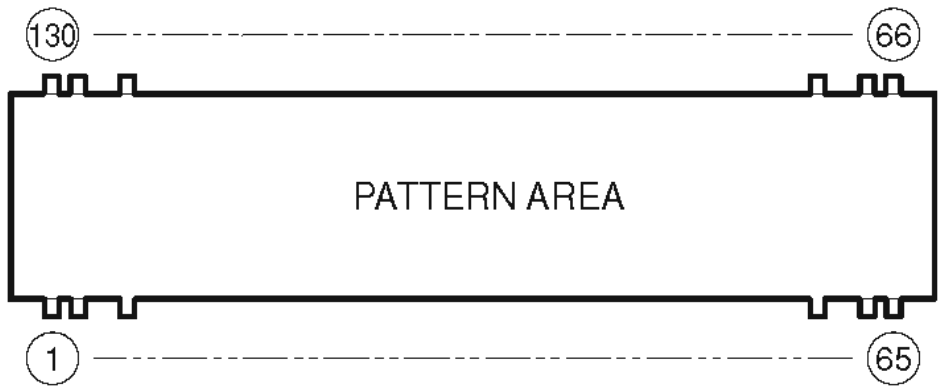
REAR


MAIN (2) P. C. B.
MAIN (3) P. C. B.
R291
R321
R319
R293
R292
R294
R322
R320
R325
POWER (3) P. C. B.
R326
R296
R327
R295
R297
MAIN (4) P. C. B.

FRONT

■ DISPLAY DATA

● **V600 : HNA-16ML10T (WF875800)**



● **PIN CONNECTION**

Pin No.	130	129	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101	100	99
Connection	F1	F1	NP	NP	P 35A	P 34A	P 33A	P 32A	P 31A	P 30A	P 29A	P 28A	P 27A	P 26A	P 25A	P 24A	P 23A	P 22A	P 21A	P 20A	P 19A	P 18A	P 17A	P 16A	P 15A	P 14A	P 13A	P 12A	P 11A	P 10A	P 9A	P 8A

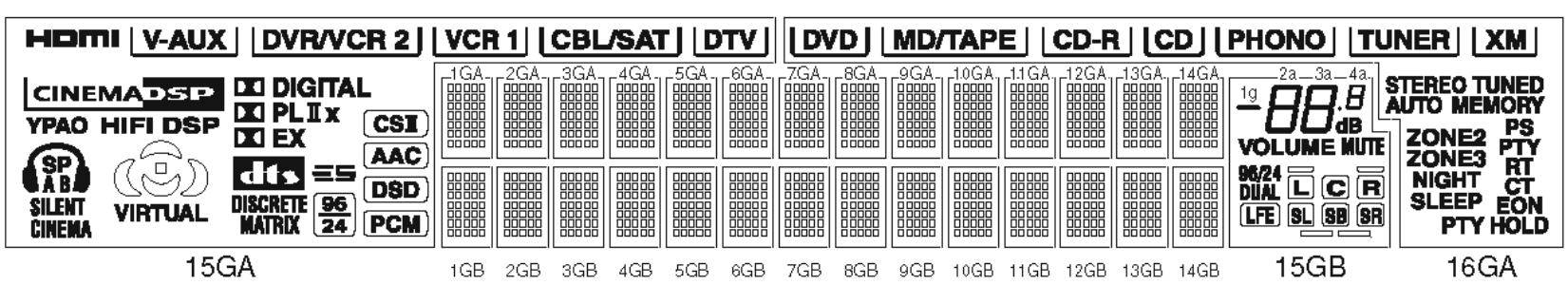
Pin No.	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66
Connection	P 7A	P 6A	P 5A	P 4A	P 3A	P 2A	P 1A	NX	NX	NX	NX	NX	NX	16 GA	15 GA	14 GA	13 GA	12 GA	11 GA	10 GA	9 GA	8 GA	7 GA	6 GA	5 GA	4 GA	3 GA	2 GA	1 GA	NP	NP	F2	F2

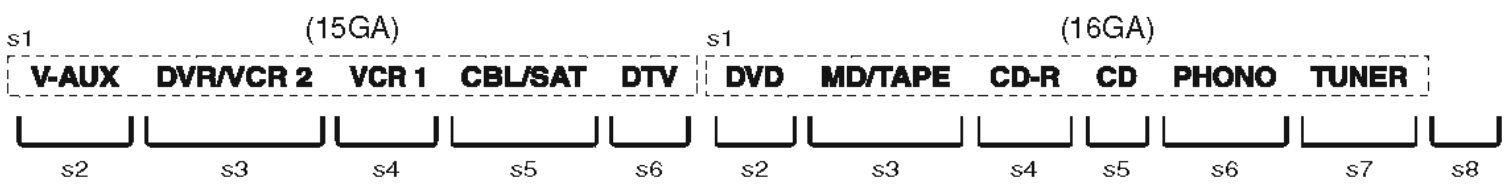
Pin No.	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Connection	P 8B	P 9B	P 10B	P 11B	P 12B	P 13B	P 14B	P 15B	P 16B	P 17B	P 18B	P 19B	P 20B	P 21B	P 22B	P 23B	P 24B	P 25B	P 26B	P 27B	P 28B	P 29B	P 30B	P 31B	P 32B	P 33B	P 34B	P 35B	NP	NP	F2	F2

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Connection	F1	F1	NP	NP	1 GB	2 GB	3 GB	4 GB	5 GB	6 GB	7 GB	8 GB	9 GB	10 GB	11 GB	12 GB	13 GB	14 GB	15 GB	NX	NX	NX	NX	NX	NX	NX	P 1B	P 2B	P 3B	P 4B	P 5B	P 6B	P 7B

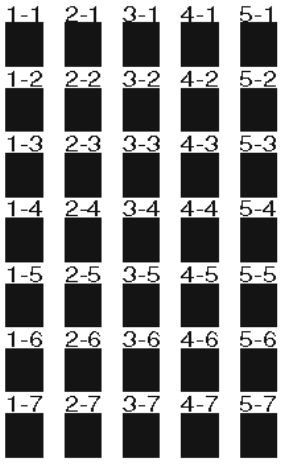
Note: 1) F1, F2 ..... Filament pin 2) 1GA~16GA, 1GB~15GB ..... Grid pin 3) P1A~P35A, P1B~P35B ..... Anode pin 4) NP ..... No pin 5) NX ..... No extended pin

● **GRID ASSIGNMENT**

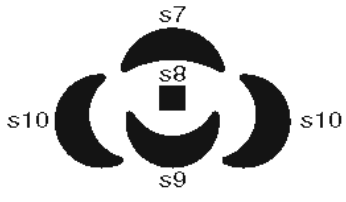




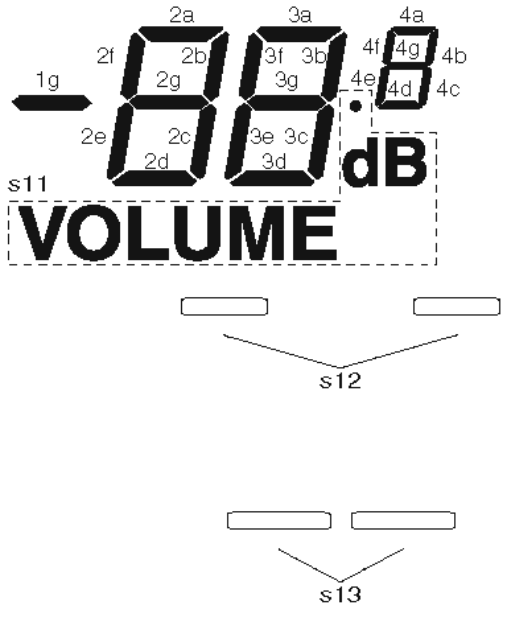
(1GA~14GA, 1GB~14GB)



(15GA)



(15GB)



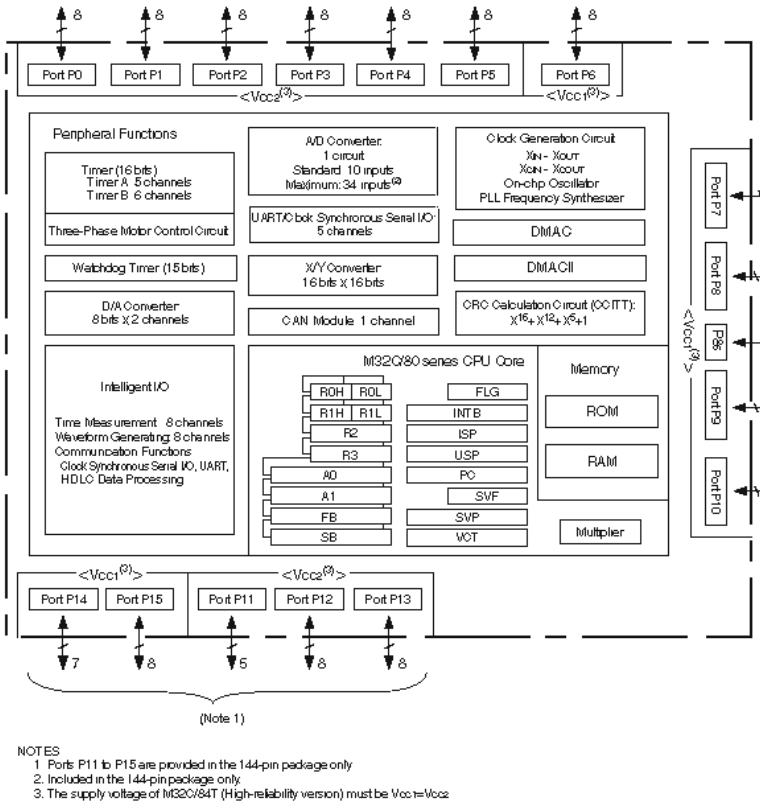
● ANODE CONNECTION

	1GA~14GA	15GA	16GA
P1A	1-1	HDMI	s1
P2A	2-1	s1	s2
P3A	3-1	s2	s3
P4A	4-1	s3	s4
P5A	5-1	s4	s5
P6A	1-2	s5	s6
P7A	2-2	s6	s7
P8A	3-2	CINEMA DSP	s8
P9A	4-2	YPAO	STEREO
P10A	5-2	HIFI DSP	TUNED
P11A	1-3		AUTO
P12A	2-3	SP	MEMORY
P13A	3-3	A	ZONE2
P14A	4-3	B	ZONE3
P15A	5-3	SILENT CINEMA	NIGHT
P16A	1-4	s7	SLEEP
P17A	2-4	s8	PS
P18A	3-4	s9	PTY
P19A	4-4	s10	RT
P20A	5-4	VIRTUAL	CT
P21A	1-5	DIGITAL	EON
P22A	2-5	PL	PTY HOLD
P23A	3-5	II	XM
P24A	4-5	X	
P25A	5-5	EX	
P26A	1-6	dts	
P27A	2-6	ES	
P28A	3-6	DISCRETE	
P29A	4-6	MATRIX	
P30A	5-6	96/24	
P31A	1-7	CSII	
P32A	2-7	AAC	
P33A	3-7	DSD	
P34A	4-7	PCM	
P35A	5-7		

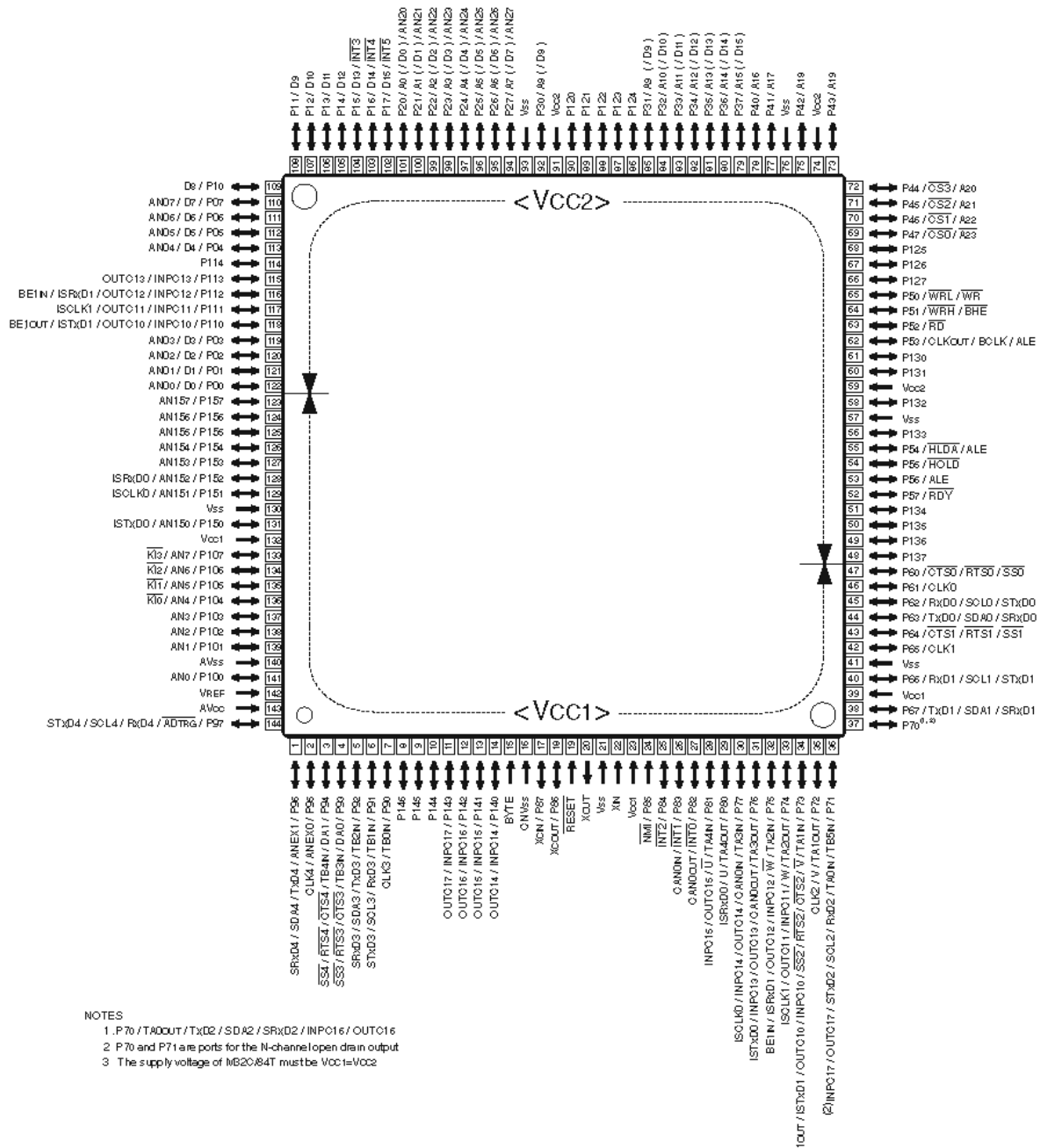
	1GB~14GB	15GB
P1B	1-1	1g
P2B	2-1	2a
P3B	3-1	2b
P4B	4-1	2c
P5B	5-1	2d
P6B	1-2	2e
P7B	2-2	2f
P8B	3-2	2g
P9B	4-2	3a
P10B	5-2	3b
P11B	1-3	3c
P12B	2-3	3d
P13B	3-3	3e
P14B	4-3	3f
P15B	5-3	3g
P16B	1-4	4a
P17B	2-4	4b
P18B	3-4	4c
P19B	4-4	4d
P20B	5-4	4e
P21B	1-5	4f
P22B	2-5	4g
P23B	3-5	s11
P24B	4-5	MUTE
P25B	5-5	96/24
P26B	1-6	DUAL
P27B	2-6	LFE
P28B	3-6	L
P29B	4-6	C
P30B	5-6	R
P31B	1-7	SL
P32B	2-7	SB
P33B	3-7	SR
P34B	4-7	s12
P35B	5-7	s13

■ IC DATA

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor



NOTES
1. Ports P11 to P15 are provided in the 144-pin package only
2. Included in the 144-pin package only.
3. The supply voltage of M32C/84T (High-reliability version) must be Vcc1=Vcc2



NOTES
1. P70 / TA0OUT / TxD2 / SDA2 / SRxD2 / INPC16 / OUTC16
2. P70 and P71 are ports for the N-channel open drain output
3. The supply voltage of M32C/84T must be Vcc1=Vcc2

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O			Function
			PowerOn	Standby	MCUSleep [OFF]	
1	TXD4	TXDH (MtoV)	SO	O	O	Data transmits to VIDEO_CPU
2	CLK4	CLKH	SO	O	O	Clock transmits to VIDEO_CPU
3	DA1	LIMIT	DA	O	O	Limiter control output
4	DA0	FAN	DA	O	O	Temperature control FAN control output
5	SDA3/TXD3/TB2in	HDIMT	TMR	O	O	HDMI MUTE input
6	SCL3/RXD3/TB1in	/EN232C	I	O	O	VIDEO_CPU 232C communication line enable control
7	TB0in	HRES	TMR	O	O	VIDEO_CPU response return input
8	P146	/ICH	O	O	O	VIDEO_CPU reset
9	P145	HREQ	TMR	O	O	VIDEO_CPUI transmission demand input
10	P144	DMT	O	O	O	Digital FULL MUTE (HI=MUTE)
11	P143	/CSDAC3	O	O	O	
12	P142	/CSDAC2	O	O	O	* Chip enable for S, C, SW2chDAC (Reserve)
13	P141	/CSDAC1	O	O	O	2shDAC (PCM1791A) * Chip enable for 6
14	P140	/CSY	O	O	O	* Chip enable for YSS930 (#0 / #1 Common)
15	BYTE	BYTE	MCU	MCU	MCU	External data bus width change: 16 bit
16	CNVss	CNVss	MCU	MCU	MCU	Processor mode selection: Single chip mode/Hi: To boot mode with a built-in flash/At the time of hard reset: It is to boot mode at P50=H, P55=L, and CNVss=H
17	P87	/ICD	O	O	O	DIR initial clear
18	P86	/ICTI	O	O	O	TI initial clear
19	RESET	RESET	MCU	MCU	MCU	
20	Xout	Xout	MCU	MCU	MCU	
21	Vss	Vss	MCU	MCU	MCU	
22	Xin	Xin	MCU	MCU	MCU	
23	Vcc	Vcc	MCU	MCU	MCU	
24	NMI	NMI	IRQ	I	I	
25	INT2	REM1	IRQ	IRQ	IRQ	Remote control pulse input 1
26	INT1	REM2	IRQ	IRQ	IRQ	Remote control pulse input 2/Remote control pulse input for zone remote control
27	INT0	RXDR	IRQ	IRQ	IRQ	RS232C/YDC reception detection
28	TA4in	/VSYNC	TMR	O	O	Vertical sync pulse INT
29	P80	/CSTI	O	O	O	Chip enable for TI decoder DSP DA601
30	TA3in/P77	TIBUSY	I	O	O	TI BUSY detection/CDDA write-in DATA input
31	P76	SPIRDY	I / I	O / O	O / O	DA601 GP0(0): TI DA601 Serial Ready / DRI WCK output: DIR WCK input (WCK input for CDDA writing)
32	TA2in	/INTTI	TMR	O	O	TI (DA601) interruption
33	P74	/CSDIR	O	O	O	Chip enable for DIR
34	TA1in	/INTDIR	TMR	O	O	DIR interruption
35	P72/CLK2/TA1out	BT232C	I / I	I / I	O / O	RS232C flash write-in mode detection / MULTI CH INPUT key detection
36	P71/RxD2/SCO2	DRXM	SI	O	O	DABIC IC RxD (XM data reception) / 1.5k pull up to +5SPC
37	P70/TXD2/SDA2	DTXM	SO	O	O	DABIC IC TxD / 1.5k pull up to +5SPC
38	P67/TxD1	TXDR	SO / SO	SO / SO	O / SO	RS232C: Usual RS-232C asynchronous communication data output / YDC: Transmitting terminal for AF220
39	Vcc	Vcc	MCU	MCU	MCU	
40	P66/RxD1	RXDR	SI / SI	SI / SI	SI [O] / SI	Usual RS-232C asynchronous communication data input / At the time of 232C driver OFF, since driver output is set to HiZ, it is LowFix processing / Transmitting terminal for AF220
41	Vss	Vss	MCU	MCU	MCU	
42	P65/CLK1	RTS / CLKF	SO / SO	SO / SO	O / SO	Usual RS-232C asynchronous communication RTS output / Clock input for AF220
43	P64/CTS1/RTS1/	CTS / YDCBUSY	I / O	I / O	I [O] / O	Usual RS-232C asynchronous communication CTS input / At the time of 232C driver OFF, since driver output is set to HiZ, it is LowFix processing / BUSY output for AF220
44	P63/TxD0	TXDD	SO	O	O	Serial data output to DIR, TI (DA601), YSS930, and DAC / DIR/ YSS: 4M, LSBF/TI: 1M, MSBF
45	P62/RxD0	RXDD	SI	O	O	Serial data reception to DIR, TI (DA601), YSS930, and DAC / DIR/YSS: 4M, LSBF/TI: 1M, MSBF
46	P61/CLK0	CLKD	SO	O	O	Serial Clock output to DIR, TI (DA601), YSS930, and DAC

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name	I/O			Function
			PowerOn	Standby	MCUSleep [AC OFF]	
47	P60		O	O	O	
48	P137	VRB	I	O	O	Volume Rotary B
49	P136	VRA	I	O	O	Volume Rotary A
50	P135	PGB	I	O	O	PROGRAM Rotary B
51	P134	PGA	I	O	O	PROGRAM Rotary A
52	P57/RDY	SCKA	O	O	O	Clock output for audio select IC
53	P56/RAS	SDTA	O	O	O	Data output for audio select IC / NJU: Transmitting clock 10us, MSB first
54	P55/HOLD	CEL	O	O	O	JRC analog SW IC CE1
55	P54/HLDA	CET	O	O	O	JRC analog SW IC CE2
56	P133	/HPMT	O	O	O [O]	Headphone MUTE control
57	Vss	Vss	MCU	MCU	MCU	
58	P132	/FATT	O	O	O	FRONT attenuate output PL/PR MIXH
59	Vcc	Vcc	MCU	MCU	MCU	
60	P131	/MIC	I	O	O	MIC detection / 220k Pull Down
61	P130	/HP	I	O	O	Headphone detection / 100k Pull Up to +5SPC
62	P53/BCLK	CKEV	O	O	O	EVOL serial transmitting clock
63	P52/RD	DTEV	O	O	O	EVOL serial transmitting data / Clock speed 1M, MSB first
64	P51/WRH	/CEEV	O	O	O	EVOL CE
65	P50/WRL	XMPWR	O	O	O	XM Radio power supply control
66	P127	/FMTSW	O	O	O [O]	Full Mute SWL/SWR/SW MONO
67	P126	/FMTC	O	O	O [O]	Full Mute Center
68	P125	/FMTS	O	O	O [O]	Full Mute SL/SR
69	P47/CS0	/FMTF	O	O	O [O]	Full Mute FL/FR/SBL/SBR
70	P46/CS1	/ICFL	O	O	O	FL driver initial clear
71	P45/CS2	CEF2	O	O	O	FL enable 1
72	P44/CS3	CEF1	O	O	O	FL enable 2
73	P43/A19	ISB	I	O	O	Input selector Rotary B
74	Vcc	Vcc	MCU	MCU	MCU	
75	P42/A18	ISA	I	O	O	Input selector Rotary A
76	Vss	Vss	MCU	MCU	MCU	
77	P41/A17	PSWA	I	I	O	INT5: After [a SSW input] logic Key distinction
78	P40/A16	PSWB	I	I	O	INT5: After [a SSW input] logic Key distinction
79	P37/A15	SRYA	O	O	O	MAIN A SP RELAY
80	P36/A14	SRYB	O	O	O	MAIN B SP RELAY
81	P35/A13	SRYC	O	O	O	CENTER SP RELAY
82	P34/A12	SRYSB	O	O	O	SURROUND BACK SP RELAY
83	P33/A11	SRYP	O	O	O	Presence/Zone SP RELAY
84	P32/A10	SRYSR	O	O	O	SURROUND/ZONE SP RELAY
85	P31/A9	FANLK	I	O	O	FAN lock detection / 100k Pull Up to +5M2
86	P124	PRY	O	O	O	Power relay control
87	P123	/ST	I	O	O	TUNER STEREO detection input / Pull Up to +5SPC
88	P122	TUNED	I	O	O	TUNER TUNED input / Pull Up +5SPC
89	P121	TUCE	O	O	O	PLL Chip select for TUNER
90	P120	/TMUTE	O	O	O	TUNER Mute output / Logic reversal according to Tr at a FUNCTION P.C.B.
91	Vcc		MCU	MCU	MCU	
92	P30/A8	PDLED	O	O	O	PureDirect LED
93	Vss		MCU	MCU	MCU	
94	AN27/P27/A7		O	O	O	
95	AN26/P26/A6		O	O	O	
96	AN25/P25/A5	/Z2MT	O	O	O [O]	Zone2 MUTE control
97	AN24/P24/A4	/Z3MT	O	O	O [O]	Zone3 MUTE control
98	AN23/P23/A3	/ICXM	O	O	O	DABIC IC reset (U model)
		–	O	O	O	(C, R, T, K, A, B, L, J models)
		RDSE	O	O	O	RDS Enable (G model)
99	AN22/P22/A2	RDATA2	O	O	O	Recout SW2 control (ROHM) data / Clock speed: 20us, MSBF
100	AN21/P21/A1	RLCK2	O	O	O	Recout SW2 control (ROHM) clock
101	AN20/P20/A0	PRI	I	O	O	Current protection detection / 100k Pull Down
102	P17/D15/INT5	PSW	IRQ	IRQ	IRQ	Main, Zone2, and 3 Power key interruption
103	P16/D14/INT4	SSW	IRQ	IRQ	IRQ	System power SW (Push lock SW)
104	P15/D13/INT3	PDET	IRQ	IRQ	IRQ	Power detect detection / At a SUPTR P.C.B., it is 100k Pull Up to 5M2

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor

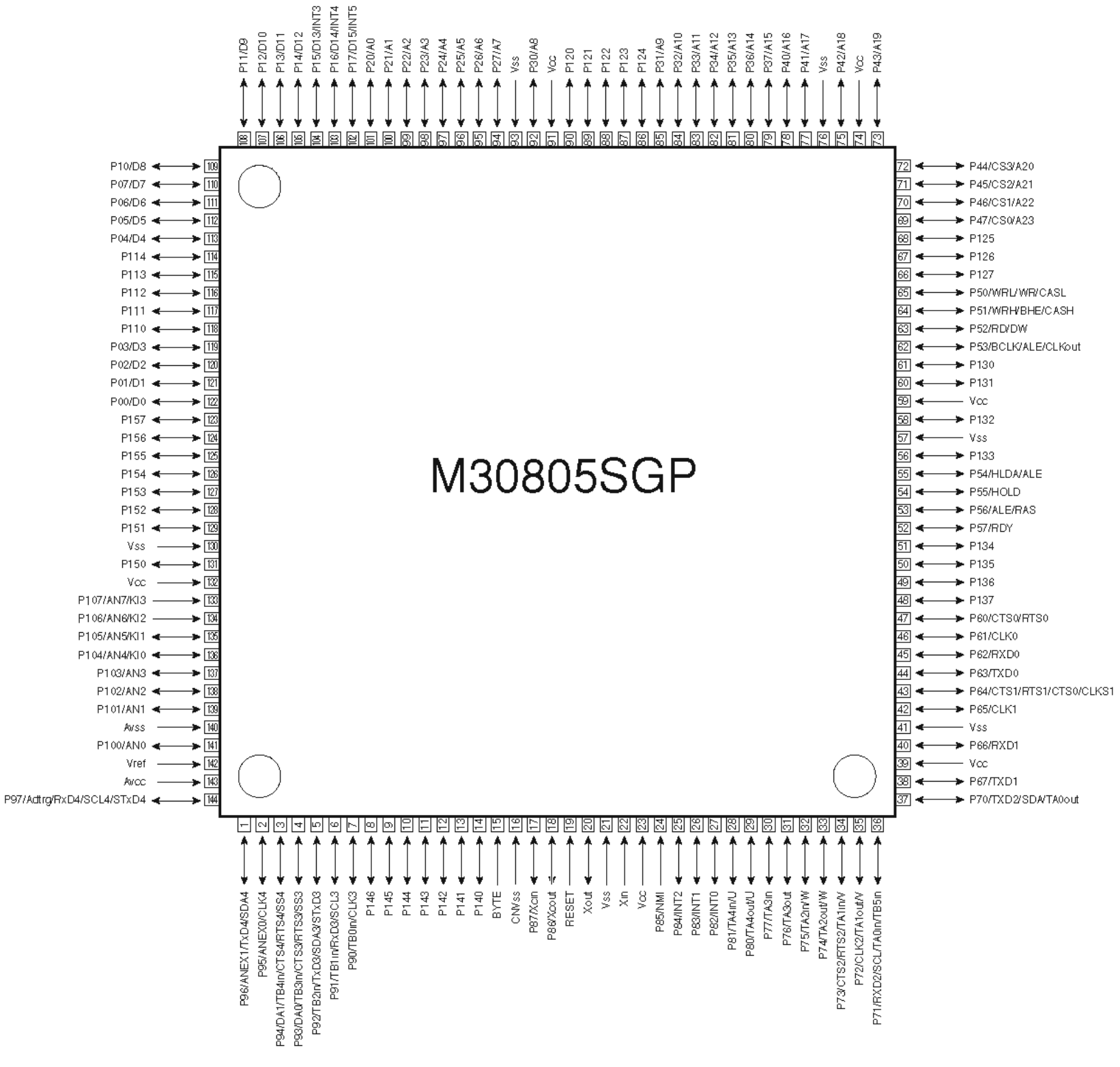
No.	Port Name	Terminal Name	I/O			Function
			PowerOn	Standby	MCUSleep [AC OFF]	
105	P14/D12	SPC	O	O	O [O]	+5SPC Power supply ON/OFF control. (L=ON/H=OFF: Standby power requirement reduction sake) / Usually, Low fixes is standby power requirement reduction (MCUSleep) by making it HI, after the processing accompanying standby is completed. (An extended port and extended A/D do not operate at the time of HI.) / The time of AC IN and MCUSleep, please hold HighFix until there is a Power On input.
106	P13/D11	TRG1	O	O	O	DC TRIGGER output 1
107	P12/D10	TRG2	O	O	O	DC TRIGGER output 2
108	P11/D9		O	O	O	
109	P10/D8	VPOWER	O	O	O	VIDEO power supply control / At the time of Pure Direct is Low (VIDEO OFF)
110	P07/AN07/D7	VMT	O	O	O	Video output MUTE / Power ON/OFF / At the time PureDirect ON/OFF, this port is logic reversed in ON * Tr.
111	P06/AN06/D6	VBOOT	O	O	O	VIDEO_CPU boot enable
112	P05/AN05/D5	232PWR	O	O	O	232C driver ON/OFF control
113	P04/AN04/D4	BTSEL	O	O	O	VIDEO_CPU boot mode select
114	P114	RDATA	O	O	O	Recout SW1 control (ROHM) data / Clock speed: 20us, MSBF
115	P113	RLCK	O	O	O	Recout SW1 control (ROHM) clock
116	P112/ISRXD1	PLLR	I	O	O	PLL reception for TUNER / Reception clock 20us / LSB first
117	P111/ISCLK1	TUCK	O	O	O	PLL clock output for TUNER
118	P110/ISTXD1	TUDA	O	O	O	PLL data output for TUNER / Transmitting clock 4us / LSB first
119	P03/AN03/D3	CKZEV	O	O	O	EVOL serial transmitting clock for ZONE
120	P02/AN02/D2	DTZEV	O	O	O	EVOL serial transmitting data for ZONE / Clock speed: 1M, MSB first
121	P01/AN01/D1	/ICZEV	O	O	O	EVOL1 Reset for ZONE
122	P00/AN00/D0	/CEZEV1	O	O	O	EVOL1 CE for ZONE
123	AN157/P157	/CEZEV2	O	O	O	EVOL2 CE for ZONE
124	AN156/P156	REC	AD	O	O	AD REC OUT SEL taking in
125	AN155/P155	KEY0	AD	O	I [O]	Key0 AD value taking in
126	AN154/P154	KEY1	AD	O	I [O]	Key1 AD value taking in
127	AN153/P153	/OSDCE	O	O	O	OSD CE
128	AN152/P152/ISRXD0	RDS	I	O	O	RDS RxD
129	AN151/P151/ISCLK0	SCKN	O	O	O	NONE AUDIO clock output (FL/RDS/OSD) / FL: 2us clock, MSBF RDS: 20us clock, LSBF
130	Vss	Vss	MCU	MCU	MCU	
131	AN150/P150/ISTXD0	SDTN	O	O	O	NONE AUDIO data output (FL/RDS/OSD)
132	Vcc	Vcc	MCU	MCU	MCU	
133	P107/AN7	DEST	AD	O	I [O]	Model distinction is based on AD value. / Waiting for after [AD input port setup] 1msec is carried out at the time of AD taking in at the time of Power On.
134	P106/AN6	MODEL	AD	O	I [O]	Model distinction is based on AD value. / Waiting for after [AD input port setup] 1msec is carried out at the time of AD taking in at the time of Power On.
135	P105/AN5	THM1	AD	O	I [O]	AD temperature detection detection 1
136	P104/AN4	THM2	AD	O	I [O]	AD temperature detection detection 2
137	P103/AN3	PRD	AD	O	O	Power amplifier DC protection detection
138	P102/AN2	PRV	AD	O	O	Power supply protection detection 1
139	P101/AN1	PRVS	AD	O	O	Power supply protection detection 2 (Power supply turned off by Pure Direct)
140	Avss	AVSS	MCU	MCU	MCU	
141	P100/AN0	PLMT	AD	O	O	AD Power Limiter detection
142	Vref	VREF	MCU	MCU	MCU	
143	Avcc	AVCC	MCU	MCU	MCU	
144	RXD4	RXDH	SI	O	O	Data reception from VIDEO_CPU

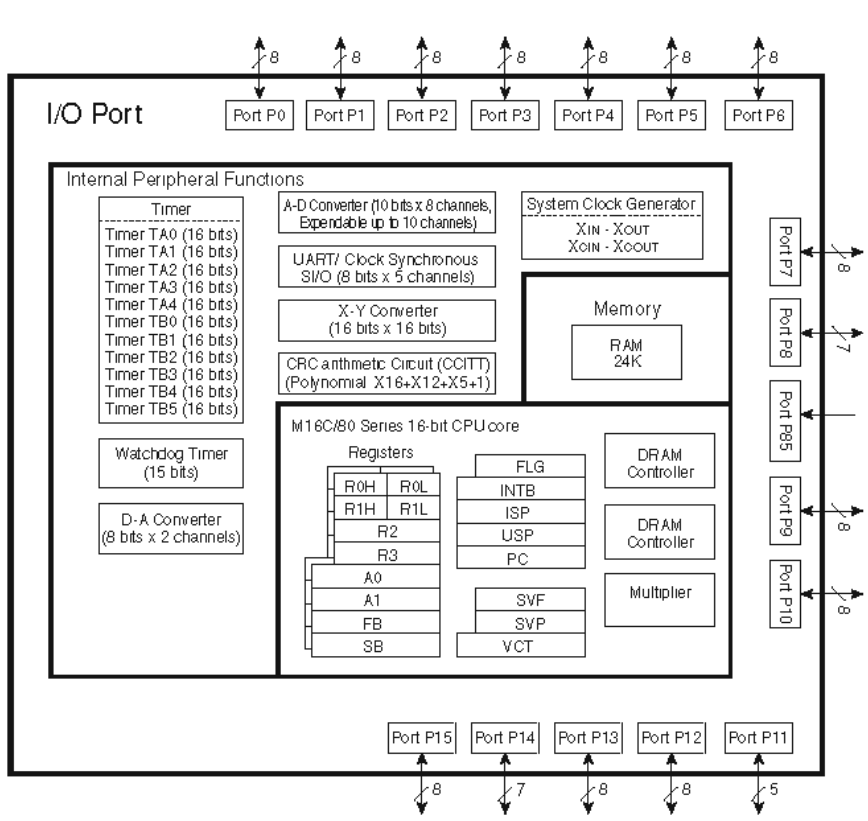
Key Input (A-D) Pull-Up Resistance 10 k-ohms

Ohm	0	+1 2k	+1.2k	+1.8k	+2.7k	+3.3k	+4.7k	+8.2k
V	~ 0.26	~ 0.75	~ 1.22	~ 1.76	~ 2.28	~ 2.75	~ 3.24	~ 3.75
KEY0	TONE CONTROL	STRAIGHT EFFECT	TUNING MODE	MEMORY	FM/AM	PRESET/TUNING EDIT	PRESET/TUNING >	PRESET/TUNING <
KEY1	ZONE CONTROL	A/B/C/D/E	AUDIO SELECT	SPEAKERS A	SPEAKERS B	PURE DIRECT	–	–

HTR-5990

IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor





IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O [OFF]	Function
1	P96/SDA4	SDAL	SIO	I2C SDA Input/Output signal (for 100kHz device)
2	P95/CLK4		O	
3	P94/TB4in	DACSEL	DA	DAC fs Select
4	P93/TB3in		O	
5	P92/SDA3	SDAH	SIO	I2C SDA Input/Output signal (for HDMI device)
6	P91/SCL3	SCLH	SO	I2C SCL Output signal (for HDMI device)
7	P90/TB0in		O	
8	P146		O	Terminal for monitors for development
9	P145		O	Terminal for monitors for development
10	P144		O	Terminal for monitors for development
11	P143		O	Terminal for monitors for production inspection
12	P142		O	Terminal for monitors for production inspection
13	P141		O	Terminal for monitors for production inspection
14	P140		O	Terminal for monitors for production inspection
15	BYTE		MCU	Data bus width setup: Set as 16bit=Low
16	CNVSS		MCU	Processor mode: Set as Hi
17	P87		O	
18	P86	BOOT (/EN232)	I [O]	YDC boot signal input/232C line opening demand (Video -> Main)
19	/RESET	/RES	MCU	Reset signal input
20	XOUT		MCU	Ceramic vibrator 10MHz
21	Vss		MCU	GND
22	XIN		MCU	Ceramic vibrator 10MHz
23	Vcc		MCU	3.3V
24	P85/NMI		I	No used
25	P84/INT2	/REM	IRQ	For development
26	P83/INT1	/INTAD	IRQ	Interruption signal from ADV7401
27	P82/INT0	/INTH	IRQ	HDMI Tx/Rx interruption
28	P81/TA4in	VS	I	HDMI VSYNC input (Reserve for frequency distinction)
29	P80/TA4out		O	
30	P77/TA3in		[I]	Starting option
31	P76/TA3out		[I]	Starting option
32	P75/TA2in	HDMINT	O	HDMI interruption demand
33	P74/TA2out	232PWR	I	232C transceiver notice input of a shutdown
34	P73/TA1in		O	
35	P72/CLK2		O	
36	P71/SCL2	SCLV	SI	I2C SCL output signal (for Video devices)
37	P70/SDA2	SDAV	SO	I2C SDA Input/Output signal (for Video devices)
38	P67/TxD1	TXD1	SO	Serial I/F for writing YDC / Serial I/F for writing debug
39	Vcc		MCU	3.3V
40	P66/RxD1	RXD1	SI	Serial I/F for writing YDC / Serial I/F for writing debug
41	Vss		MCU	GND
42	P65/CLK1	RTS1	O	Serial I/F for writing YDC/232C
43	P64/CTS1	CTS1	I	Serial I/F for writing YDC/232C
44	P63/TxD0	VtoM	SO	MAIN microcomputer I/F SPI
45	P62/RxD0	MtoV	SI	MAIN microcomputer I/F SPI
46	P61/CLK0	MCLK	SI	MAIN microcomputer I/F SPI
47	P60/CTS0/RTS0	MRES	O	MAIN microcomputer I/F RES output signal
48	P137	MREQ	O	MAIN microcomputer I/F REQ output signal
49	P136		O	
50	P135	SPIRDY	I	Word clock input for writing CDDA
51	P134	SPIDAT	I	Data input for writing CDDA
52	P57/RDY	/RDY	I	YGV/WAIT signal input
53	P56/ALE/RAS		O	No used
54	P55/HOLD		I	No used
55	P54/HLDA/ALE		O	No used
56	P133	PSENB	O	HDMI Power Signal Enable
57	Vss		MCU	GND
58	P132	DDCENB	O	HDMI DDC Enable control
59	Vcc		MCU	3.3V

IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O [OFF]	Function
60	P131	HPD1ENB	O	HDMI HPD1 Enable control
61	P130	HPD0ENB	O	HDMI HPD0 Enable control
62	P53/BCLK		O	No used
63	P52/RD/DW	/RD	BUS	BUS I/F
64	P51/WRH/BHE		BUS	BUS I/F
65	P50/WRL/WR	/WR	BUS	BUS I/F
66	P127		O	
67	P126		O	
68	P125		O	
69	P47/CS0/A23		BUS	
70	P46/CS1/A22		BUS	
71	P45/CS2/A21		BUS	FLASH A20/NC2, YGV A21
72	P44/CS3/A20		BUS	FLASH A19/NC1, YGV A20
73	P43/A19		BUS	FLASH A18, YGV A19
74	Vcc		MCU	3.3V
75	P42/A18		BUS	FLASH A17, YGV A18
76	Vss		MCU	GND
77	P41/A17		BUS	FLASH A16, YGV A17
78	P40/A16		BUS	FLASH A15, YGV A16
79	P37/A15		BUS	FLASH A14, YGV A15
80	P36/A14		BUS	FLASH A13, YGV A14
81	P35/A13		BUS	FLASH A12, YGV A13
82	P34/A12		BUS	FLASH A11, YGV A12
83	P33/A11		BUS	FLASH A10, YGV A11
84	P32/A10		BUS	FLASH A9, YGV A10
85	P31/A9		BUS	FLASH A8, YGV A9
86	P124	YGVDET	I	Pull down: No YGV
87	P123	VTEST1	O	Self inspection result is outputted for production inspection (Video)
88	P122	VTEST2	O	Self inspection result is outputted for production inspection (Video)
89	P121	VTEST3	O	Self inspection result is outputted for development (Video)
90	P120	VTEST4	O	Self inspection result is outputted for development (Video)
91	Vcc		MCU	3.3V
92	P30/A8		BUS	FLASH A7, YGV A8
93	Vss		MCU	GND
94	P27/A7		BUS	FLASH A6, YGV A7
95	P26/A6		BUS	FLASH A5, YGV A6
96	P25/A5		BUS	FLASH A4, YGV A5
97	P24/A4		BUS	FLASH A3, YGV A4
98	P23/A3		BUS	FLASH A2, YGV A4
99	P22/A2		BUS	FLASH A1, YGV A2
100	P21/A1		BUS	FLASH A0, YGV A1
101	P20/A0		BUS	No used
102	P17/D15/INT5	D15	BUS	Data bus
103	P16/D14/INT4	D14	BUS	Data bus
104	P15/D13/INT3	D13	BUS	Data bus
105	P14/D12	D12	BUS	Data bus
106	P13/D11	D11	BUS	Data bus
107	P12/D10	D10	BUS	Data bus
108	P11/D9	D9	BUS	Data bus
109	P10/D8	D8	BUS	Data bus
110	P07/D7	D7	BUS	Data bus
111	P06/D6	D6	BUS	Data bus
112	P05/D5	D5	BUS	Data bus
113	P04/D4	D4	BUS	Data bus
114	P114	/ICP	O	IC signal to PD0280B. Cancels after Clock supply.
115	P113	/AUPH	O	Video course (Decoder output) to HDMI ON/OFF
116	P112		O	
117	P111	/ICY	O	IC signal to YGV619
118	P110	/ICV	O	IC signal to Video system device

IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

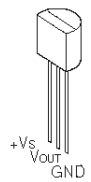
No.	Port Name	Terminal Name (P.C.B.)	I/O [OFF]	Function
119	P03/D3	D3	BUS	Data Bus
120	P02/D2	D2	BUS	Data Bus
121	P01/D1	D1	BUS	Data Bus
122	P00/D0	D0	BUS	Data Bus
123	P157	/AUPS	O	Video course (Scaler output) to HDMI ON/OFF
124	P156	/AUPP	O	Video course (MS1A output) to HDMI ON/OFF
125	P155	/AUPI	O	Video course (480i output) to HDMI ON/OFF
126	P154	/OSDCEV	O	Chip enable output to OSD
127	P153	BDEN	O	Enable for BD7851 control
128	P152	BDLT	O	Latch for BD7851 control
129	P151	SDTV	O	Data for BD7851control
130	Vss		MCU	GND
131	P150	SCKV	O	Clock for BD7851 control
132	Vcc		MCU	3.3V
133	P107/AN7	/MTMON	O	MUTE to the monitor out from a Video microcomputer
134	P106/AN6	/MTZ2	O	MUTE to the ZONE2 out from a Video microcomputer
135	P105/AN5	Reserve	O	
136	P104/AN4	SVDET	I	S input detection
137	P103/AN3	VBOOT	I	Enable to boot mode
138	P102/AN2	BTSEL	I	Boot mode select
139	P101/AN1	Reserve	I	
140	Avss		MCU	GND
141	P100/AN0		O	
142	Vref		MCU	3.3V
143	Avcc		MCU	3.3V
144	P97/SCL4	SCLL	SO	I2C SCL output signal (for 100kHz device)

MEMO

■ PIN CONNECTION DIAGRAM

• ICs

LM61CIZ



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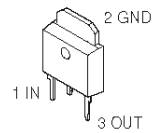

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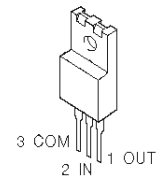

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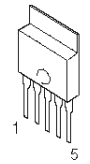

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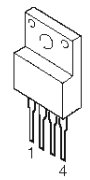

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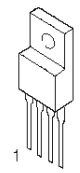

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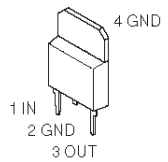

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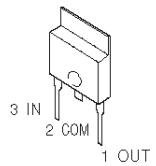

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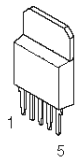

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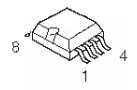

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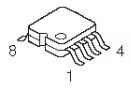

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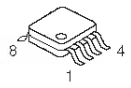

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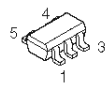

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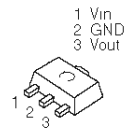

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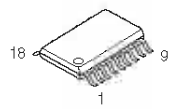

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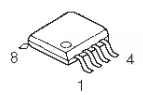

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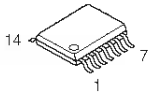

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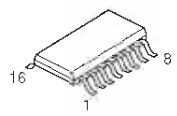

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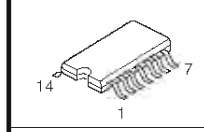

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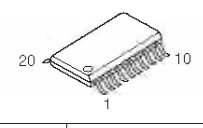

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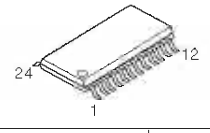

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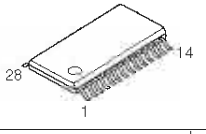

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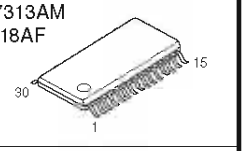

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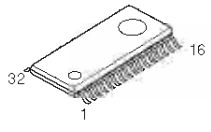

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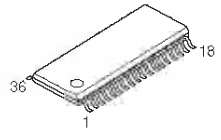

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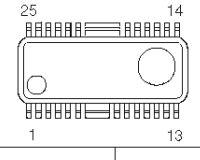

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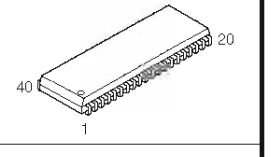

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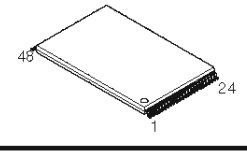

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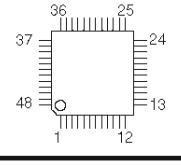

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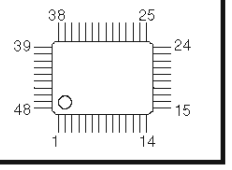

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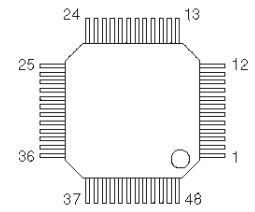

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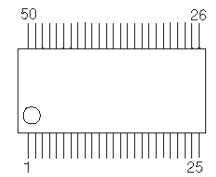

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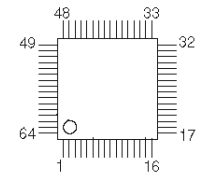

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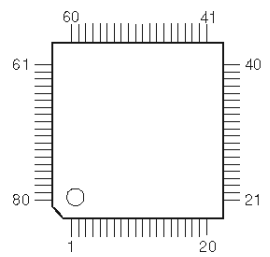

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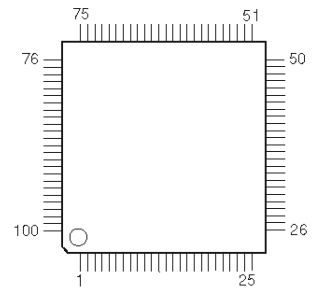

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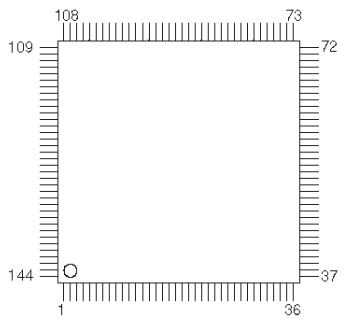

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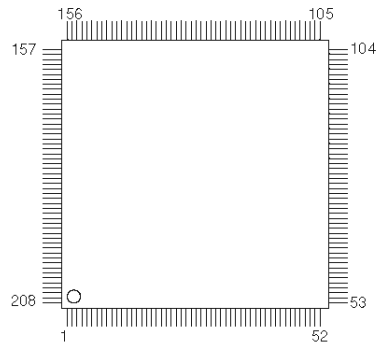

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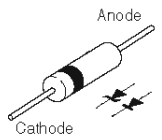
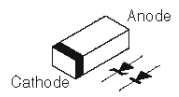
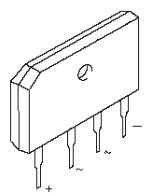
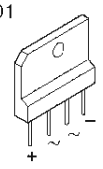
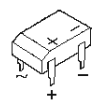
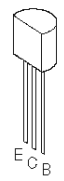
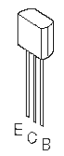
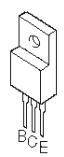
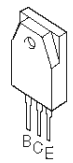
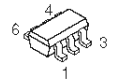
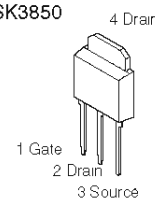
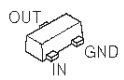
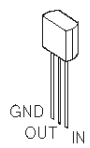
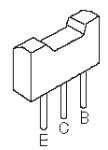
1N4002S 1SS133 1SS244 1T2 HZS24-1 HZS242TD HZS3B1TD MTZJ10B MTZJ13A MTZJ33B MTZJ4.7C MTZJ5.1B MTZJ5.1C MTZJ6.8B MTZJ7.5C 	1SS355 1SS380 MA8043-L MA8051-M MA8062-M MA8068-L MA8100-L MA8130-M RB500V-40 RB501V-40 UDZ5.1B UDZS3.9BTE-17 UDZS5.6BTE-17 	
D2SBA20 	D15XB20 D4SBS4-4101 	S1NB20 S1NB60 

• Transistors

2SA1015 2SA949 2SA970 2SC1815 2SC2229 2SC2240 2SC2878 	2SD1915F 	2SA1837 2SB1257 2SB1274 2SB941 2SC3852 2SC4793 2SD2014 	2SA1492 2SC3856 	µPA672T-T1-A 1 Source 1 (S1) 2 Gate 1 (G1) 3 Drain 2 (D2) 4 Source 2 (S2) 5 Gate 2 (G2) 6 Drain 1 (D1) 	2SK3850 
2SA1036KT146 2SA1037K 2SC2412K 2SC3326 2SC3878K 2SC3906K 2SC4081 2SD1938F 	2N7002-NL 2SK208 2SK2158-T2B-A 5HP01C-TB-E 	DTA114EKA DTA144EKA DTC114EKA DTC144EKA 	DTC144ESA-TP 	2SA1708 2SC4488 	2SK246